

003 - Stochastic Modelling of the Philippine Stock Exchange Composite Index (PSEi)

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The different financial markets could be regarded as stochastic systems. An empirical study conducted by Janairo and Roleda (2011) showed that the PSEi time series has a probability distribution function (PDF) that varies with time. However, when the acceleration of the index was computed, the time series was found to generally follow a Johnson SU distribution. This indicates that the index could not be modelled as a simple random walk system. In this study, we modelled the dynamics of the PSEi using daily data from 2000 to 2011. The PDFs were determined from the daily data of the PSEi which will be the basis for constructing an additive stochastic model. The model was implemented computationally using Monte Carlo methods, and the computed time series of the PSEi was found to hew closely to the actual values.

004 - Folding Powers of Paths and Cycle

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If two non-adjacent vertices of a connected graph that have a common neighbor are identified and the resulting multiple edges are reduced to simple edges, then we obtain another graph of order one less than that of the original graph. This process can be repeated until the resulting graph is complete. We say that we have folded the graph onto complete graph. In 2006, Jose Bacoy Jr. in his thesis entitled "Folding the Sum, Cartesian Product, Composition and Square of Graph" found an upper bound for the order of the complete graph that 1) the square of a path with n vertices, P_n^2 , and 2) the square of a cycle with m vertices, C_m^2 can fold onto. The k th power of a graph G is a graph with the same set of vertices as G and an edge between two vertices if and only if there is a path of length at most k between them. The maximum value of k is equal to the diameter of the graph G , $\text{diam}G$, since raising any graph to the power of its graph diameter gives a complete graph. This paper extends the results of J. Bacoy Jr. to the powers of paths and cycles in general. The upper bound for the order of the complete graph that P_n^k and C_m^k can fold onto will be investigated.

005 - Comparison of Stock Market Dynamics: Blue Chip vs. Speculative Stock

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The dynamics of stock prices are stochastic in nature that could be modeled based on the probability distribution of the time series. In a seminal work on financial systems, Bachelier demonstrated that the time series of a simple random walk system would have a Gaussian distribution. We studied the stock's dynamics of two companies in the Philippine stock exchange, one representing Blue chip and the other Speculative stock. We found that while the time series of the speculative stock has a good fit with Gaussian distribution, the same is not true for the blue chip. This indicates that speculative stock could be modeled as a simple random walk system whereas the dynamics Blue chips are more complicated. Autocorrelation studies however shows that the stock prices of blue chips are nevertheless independent and identically distributed. Phase portrait of the Blue chip showed that the dynamical state is dense within the central region, whereas speculative stocks exhibited significant amounts of excursions away from the central region.

006 - Characterization of Ayala Land Corporation Stock Dynamics

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The dynamics of stock prices are stochastic in nature that could be modeled based on the Probability distribution of the time series. In a seminal work on financial systems, Bachelier demonstrated that the time series of a simple Random walk system would have a Gaussian distribution. In this work, we study the probability distribution for the time series, the autocorrelation characteristics as well as face portrait analysis of Ayala land corporation stock prices. The dynamics of the stock is correlated with the macroeconomic review and other financial measure.

008 - Effects of Extracts of *Momordica charantia* and *Lagerstroemia speciosa* on Porcine Pancreatic Alpha-Amylase

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The effect of crude leaf extracts from *Momordica charantia* and *Lagerstroemia speciosa* on porcine pancreatic alpha-amylase (E.C. 3.2.1.1) was determined. Crude extracts from the leaves was added to a reaction mixture containing pancreatic alpha-amylase from hog pancreas. The enzyme alpha-amylase or glycogenase catalyzed the endohydrolysis of (1→4)-a-D-glycosidic linkages in oligosaccharides and polysaccharides. Starch was used as the substrate of a-amylase. The rate of hydrolysis of starch was monitored using Bernfeld Assay. Michaelis-Menten and Lineweaver-Burk Plot was constructed to determine the enzymatic effect of the extracts on the Michaelis-Menten constant (KM) and maximum velocity (Vmax) of a-amylase. After construction of the graphs and comparison with the control, it was found that both plant leaves extracts exhibit characteristics of a mixed reversible inhibitor. The Michaelis-Menten constant and maximum velocity values both increased for *Momordica charantia* and *Lagerstroemia speciosa* as compared with the control. Results of the study will be valuable in the search for therapeutic remedies for diabetes.

009 - Determinants of Membrane Activity from Mutational Analysis of the HIV Fusion Peptide

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We synthesized a small library of 38 variants of the 23-residue fusion peptide domain found at the N-terminus of gp-41 glycoprotein of HIV. This hydrophobic, glycine-rich sequence is critical for viral infectivity and is thought to be a central component in the membrane fusion of viral envelope with the host membrane. There has been extensive discussion in the literature regarding the origin of fusogenicity in this viral fusion sequence. Our library of fusion peptide variants was designed to address the biophysical importance of secondary structure, peptide flexibility, glycine content and placement. We assayed each peptide for its ability to induce lipid-mixing (FRET dilution) and membrane-permeabilization in synthetic vesicles (Calcein leakage). We find that the viral fusion peptide required may be greatly simplified while retaining fusogenic function and minimizing membrane-permeabilizing function; to the best of our knowledge, this is the first attempt to optimize fusogenic function of the HIV fusion peptide through sequence variation. Our data show that many flexible, linear, minimally hydrophobic peptides may achieve the biophysical function of fusion; glycine does not appear to be essential. These findings will be useful in the design of synthetic fusogens for cellular delivery.

010 - Treatment of Quick Service Restaurant Wastewater through Compact Electro-coagulation Technology

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Waste-by-products in Quick Service Restaurants (QSR) business include restaurant garbage (solid waste) and restaurant wastewater which are discharged to the water environment. QSR wastewater is highly organic because of cooking oils, animal fats and presence of food particles left-over that escape from sink strainers. QSR wastewater, after pre-treatment through the grease trap, is generally discharged to the sewage lines. By grease trap alone, the removal of pollutants such as chemical oxygen demand (COD), fats, oil and grease (FOGs) and total suspended solids (TSS) are inadequately removed to meet the effluent standards set by DENR through its DAO 35. Since QSRs are considered small scale industries (SSIs), it is therefore essential to consider a compact wastewater treatment technology that is easy to operate and maintain, require less space to install and perform efficiently to meet the required effluent standards for discharge. Electro-coagulation (EC) is a promising compact wastewater treatment technology in removing metals, colloidal solids and particles, and soluble inorganic pollutants. A sacrificial metal anode is used to dose polluted water with coagulating agent and simultaneously, released electrolytic gases from the cathode. In this study, aluminum (Al) and iron (Fe) electrodes totaling to four, were positioned vertically upright inside the EC reactor and connected in parallel to a voltage source. The wastewater was obtained from the grease trap in one of the canteens in DLSU-Manila, and possessed characteristics comparable with that of a QSR wastewater. Full-factorial design of experiments which include the electrode configurations and initial pH of wastewater as the factors and 4 (Fe-Fe, Fe-Al, Al-Fe, Al-Al) and 2 (pH 6 and 8) levels were applied respectively. The experiments were performed by batch for nearly two hours and 16 runs were made and duplicated. Response Surface Methodology (RSM) was used to identify the relationships of various parameters. The results showed highest removal in FOGs, 95.98% at initial pH 6, in Fe-Fe configuration because of the immediate conversion from Fe²⁺ to Fe³⁺ which led to the destabilization of the emulsion in the EC reactor and the precipitation of ferric hydroxide via mixing. The electrodes induced a current from 1 to 3.5A at constant voltage input of 21.4V. The important parameters that were optimized improved the treatment efficiency on FOG by 58.09% and TSS by 68.19% at pH 6, 20 minutes of electrolysis time and Al-Fe electrode configuration. Overall, the EC technology was found to be an effective treatment technology for QSR wastewaters after grease trap.

013 - Primary Influences on the Environmental Perspectives and Habits of Elementary School Students in an Urbanizing Locality

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The environment is at a precarious state; the changes it is encountering threatening current ways of life. Effective adaptation towards these changes rely on learning from past mistakes but in order to create a future of environmental sustainability, facts and knowledge alone would be useless without the support and understanding of everyone involved. In terms of effective environmental management, the maximization of the participation of all stakeholders to aid in the resolution of current environmental issues must be ensured. Considering the potentials of the youth and their role as custodians of the future, inculcating a culture of ecological responsibility today could lead to more effective ways to care for nature. In the goal of enjoining and empowering them towards environmental responsibility, identification of the major influences on the environmental perspectives of a sample group of

elementary school students from a rapidly urbanizing capital of the province of Bataan, Philippines - Balanga City - was done. Results show a distorted perspective of the environment as well as half-baked efforts towards environmental responsibility due to conflicting information from the major influences that the children were most aware of – their school and their homes. Lessons learned in a classroom environment are rarely seen practiced at home and the limited responsibility ascribed to children prevents them from stepping up and demanding change where they see fit. Access to mass media are also available but limited. They provide the children, at most, accessory information that are neither explained to them nor made relevant to their daily lives. No significant lack of awareness were found in the children but to empower them an effective social mobilization campaign that makes use of the potentials of the school, the local government as well as the various forms of mass media must be done to acquire the support from their families.

014 - Parametric Study on Carbon Nanofiber Production via Thermocatalytic Decomposition of Methane using Box-Behnken Design

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The Thermocatalytic Decomposition of Methane (TCD of Methane) is an alternative method that produces Hydrogen and Carbon Nanofibers. Carbon Nanofibers (CNFs) can be used for silicon wafer production, batteries and fuel cells, scaffolds for tissue engineering, catalytic support, and as yarn for lightweight bulletproof uniforms among others. Though the effects of the parameters temperature and space velocity on the textural properties of carbon nanofibers production via methane decomposition have been studied, less attention has been given to its effects on the amount of CNFs produced. The full potential of CNFs is not maximized due to its high cost. Knowing the parametric effects on CNF yield will help improve its production. As such, this study determined the effect of reaction temperature, space velocity and inlet methane concentration on CNF yield. The catalyst used was Ni-Cu/Al₂O₃. The loading was 14% nickel and 7% copper which was based from the maximum capacity of the alumina support. The Box-Behnken design of experiments was employed. The amount of CNFs deposited on the surface was determined using a Thermogravimetric Analyzer (TGA). The presence of CNFs were seen using a Scanning Electron Microscope (SEM) while its crystallographic structure was determined using an X-Ray Diffractometer (XRD). It was determined that an increase in temperature and space velocity resulted to an increase in the yield. The yield increased with an increase in inlet methane concentration until 26.76% (v/v) after of which the yield decreased. Using Analysis of Variance (ANOVA) it was found out that among the three parameters studied, temperature was the most significant. Characterization of the spent catalyst showed the formation of both nanofibrous carbon and carbon particles. SEM images showed that the nanofibers produced are curly in nature which was due to the thermal heating of the system. XRD analysis further confirmed the presence of carbon nanofibers in the sample.

015 - The Effect of Chemical Treatment on ITDI Coconut Shell-Based Activated Carbon for Arsenic Adsorption

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Arsenic is a naturally occurring element and is abundant in the environment. It is perilous to humans and aquatic life and is known for its acute and long-term toxicity. Similar to other toxic heavy metals, arsenic may be introduced in the environment through various human activities in the urban, industrial and mining areas. In addressing the problem of arsenic pollution in water, adsorption has been one of

the accepted technologies. Coconut which is abundant in the Philippines was used as base material in the manufacture of the activated carbon used as adsorbent. The activated carbon was treated using three different ratios of nitric acid to sulphuric acid (1:0; 1:1; 3:1) in order to study its effect on the arsenic adsorption capacity of the ITDI-AC. The untreated and treated ITDI-AC have high porosity and low surface iron content (0.33%) as shown in the SEM/EDX analyses. Ferrous-ferric oxide (magnetite) was identified in the XRD characterization while carboxylic acid, phenol groups, alkynes, and alkanes were the functional groups determined using FTIR. Following the pH drift tests, the treated carbons were found acidic (pHPZC 1.88, 2.18, 2.11) while the untreated ITDI-AC was almost neutral (7.17). Batch adsorption was carried out by varying the initial arsenic concentration (1.25, 2.50, 3.75, 5.00, 6.25, 7.50, 8.75, and 10.00 mg/L) while the temperature, shaking speed, and pH were held constant at 25°C, 150 rpm, and 7.8, respectively. The treated activated carbon was able to remove arsenic at an average of 20.4%. Adsorption Isotherm results showed that the arsenic adsorption process can be well fitted in the Langmuir adsorption model. The maximum adsorption capacity was 0.0269mg/g and was observed in the nitric acid-treated carbon (ACNA).

016 - Design of a Microcontroller Based DC-DC Boost Converter for Optimal Heat-To-Electrical Conversion of a TEG

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TEGs are devices that convert waste heat to electrical energy. They are made of materials like Bismuth Telluride that generate a voltage whenever one of its sides (i.e. hot side) feels a different temperature from the other side (i.e. cold side) also known as the Seebeck effect. The higher the temperature difference the higher the power produced. However, this differential temperature is not constant, hence power fluctuates. This is not practicable for powering up electronic devices like cellphone, and PSP. In this study, the output of the TEG is fed to a dc-to-dc converter for regulation before applying to the electronic devices aforementioned. DC-to-dc converters maintain a constant voltage at the output even if the input voltage fluctuates. The main advantage of this design over commercially available dc-to-dc converter is that it can convert as low as 0.7V and produces a variable output from 3V to 15V. The output voltage can be adjusted through push buttons, or through a potentiometer. The microcontroller is used to generate and control the pulse-width-modulation signal that is fed to the switching circuit. A start-up battery is used to power up the whole system when no heat yet is applied to the TEG. Once heat is applied to the TEG, the system self-powers itself by storing energy to a standby battery. The source of heat is the heat pipe of a scooter. The efficiency of the dc-to-dc converter is measured at various inputs and loads. A minimum of 60% efficiency is observed for 1.2V input at 3.3V, 100mA load while a remarkably high efficiency of 90% is obtained for a 3.6V input with a 5V, 400mA load.

017 - Instrumentation of a Solar Dryer for Microalgae-to-Biofuel Production: A Green Mechatronics Approach

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Due to its tropical climate and the abundance of indigenous species of microalgae, the Philippines has excellent potential to develop an algal industrial sector. Microalgae are known to be microorganisms

which contain oil that can be processed to biofuels. Moreover, they present an alternative source of biomass energy with less land requirement compared with terrestrial crops. However, the drying of microalgae in the post cultivation process is a major bottleneck that accounts about 25-30% of the total production cost and energy requirement. Implementation of a solar dryer would reduce cost and enhance yield production. Using green mechatronics approach, an experimental setup of characterizing the drying process of solar dryer utilizing *Tetraselmis sp* microalgae is presented in this work. The characterization requires field experimentation which can be best done by an automated data acquisition system. Employing Agilent 34970A data acquisition system, an automated approach in acquiring drying rate, temperature, and relative humidity data were achieved in this study. The drying rate, temperature and relative humidity were measured using strain gauge load cell, LM35 temperature sensors and capacitive relative humidity sensors, respectively. Solar radiation was measured using a pyranometer. The results are then compared with published studies done in other countries.

018- Development of Textrodes Applied in a Three-Lead Electrocardiogram System

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Development of non-adhesive, non-woven active electrodes commonly called textrodes were done as alternative electrodes in the application of a three-lead ECG (electrocardiogram) system on human test subjects. We used a blackout fabric material to minimize Silver/Silver chloride (Ag/Ag-Cl) conductive ink depletion arising from fabric microholes and mechanical wear and tear use. Low-noise precision dual operational amplifiers (TLC272CP), ceramic capacitors and low-watt resistors were connected together on electronic circuit board to amplify biopotentials emanating from landmark human skin test sites. These electronic components were mounted and glued inside the fabric material to minimize electrical noise and interruptions. In order to evaluate the performance of the test textrodes, simultaneous acquisition of ECG signals were done for both the test textrodes and conventional electrodes. A Vernier LabPro ECG system was used to acquire the ECG biopotentials thru these electrodes. The Vernier LabPro ECG system consists of a handheld two-channel data acquisition system connected to an ECG black box to amplify and filter out unwanted signals coming from both electrodes. The handheld data acquisition system is connected to the desktop PC through a USB port to transfer the digitized signal from the handheld data acquisition system to the desktop PC. The transferred digital signal are then processed and displayed on the display screen through the Logger Pro 3 software installed in the desktop PC. Time interval between relevant ECG inter-peaks (i.e. P-P, R-R, and T-T time intervals) and root-mean-square voltage (V_{rms}) values were determined and compared between these electrodes. Both electrodes showed similar ECG curve profiles in all major ECG peaks with an error bar of $\pm 10ms$ in the time interval domain. There was an average gain of 1.03 in the V_{rms} of the ECG peak signals obtained from the textrodes in comparison to the ECG peak signals acquired from the conventional electrodes. This demonstrates the viability of the fabricated textrodes as alternative electrodes within the permissible range cited beforehand for a three-lead ECG system. Further research study has to be done on the wearability and reliability of the fabricated textrodes for prolonged utilization.

019 - Consolidation Properties of Mine Tailings from Selected Mining Sites in the Philippines

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Mining operations and processes produce large amount of wastes called mine tailings, which presents hazards not only to the environment but also to human health when not properly disposed. Locally, the construction of earth structure called mine tailing dams play a vital role in containing these mine wastes,

in which the tailings themselves are used as the embanking materials. There were already instances that because of the lack of information on the structural and geotechnical characteristics of mine tailings, spilling of dams has occurred locally and affecting nearby areas. As such, it is important to determine the consolidation properties of these tailings to be used as design parameters for safety and stability. These were obtained through subjecting three mine tailings samples, the Davao Gold Tailings, Masbate Gold Tailings and Cavite Aggregate Tailings, to consolidation test using the oedometer apparatus following ASTM standards. To simulate actual site scenario, a 90% relative density was considered for all of the mine tailings. Test results showed that the consolidation parameters are comparable to those of impermeable soils. The three mine tailings have low values of coefficient of consolidation in which it could be implied that the pore water pressure was slowly draining as supported by the low hydraulic conductivity computed. Moreover, the preconsolidation pressures of the three tailings were graphically obtained and were estimated at more or less 40 kPa, suggesting that the samples would be normally consolidated at lower stresses. From these findings, it could be concluded that the mine tailing samples can be used as embankment materials and seepage problem can be minimized since it would take longer time for water to be completely drained, however, tailings would not be suitable to support heavy structures. From the parameters obtained, settlement analysis could be performed and the time to reach a particular magnitude of settlement could be predicted.

022 - Using an Adaptive Neuro-Fuzzy System to Classify Colonic Histopathological Images

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Cancer of the colon has been known to be one of the most common deadly illnesses all around the world. Similar to other types of cancers, early detection of cancer of the colon is key to a successful treatment. Traditionally, pathologists use microscopes to examine histopathological images of biopsy samples taken from patients and make judgments based on their professional expertise. Since this procedure is performed by a human expert, it is therefore subject to inconsistencies due to factors that might affect human performance. To overcome this problem, it has been proposed to use soft computing paradigms to improve the analysis of medical images such as histopathological images of colonic tissues. This paper reports on the results of a study conducted that made use of ANFIS or Adaptive Neuro-Fuzzy Inference System to automatically classify colonic histopathological images given a training dataset and a testing dataset. The usefulness of ANFIS comes from the fact that it elegantly combines the advantages of feedforward artificial neural networks and fuzzy logic inference systems. This excellent combination of these two powerful systems allows one to exploit the approximate reasoning capabilities of fuzzy logic even without a human expert to provide the necessary inference rules. Results show tremendous promise on the applicability of ANFIS to this type of classification problem.

024 - Data Mining Approach to Automatic Genre Classification

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Document classification is a research problem that is being addressed in several fields of study such as library science, information science and computer science. In computer science, the problem is being dealt with algorithmically and to date various algorithms have been devised to automate the process of classifying documents. Particularly, the field of data mining, which finds and describes structural patterns in data, offers a variety of techniques (e.g. classification, clustering and association) that could automate the classification of documents. These document classification techniques can be applied to spam filtering, topic spotting, language guessing, and genre classification. Films have been considered a source of popular entertainment and a powerful tool of communication. With the advancement of Internet technology, consumers have access to an unprecedented amount of movies from various on-line services. This has created the need for automatic content-driven movie recommendation. Movie genres still act as a key attribute in such recommendation systems [Zhou, et al, 2010]. Specifically, our paper addresses the application of classification algorithms to automatically classify the genre of a movie given its synopsis. It presents a system that extracts hundreds of movie synopses from IMDB (Internet Movie Database), pre-processes the synopses by POS (part of speech) tagging, cleaning of the words, selection of words, and then transforming the data into formats that can be recognized by the selected classification algorithms. Figure 1 shows the system flowchart of building the Movie Genre Classifier models. The system makes use of Weka, which is a collection of data mining algorithms. It is a free and open source application. Three classification algorithms were chosen, namely J48, Naive Bayes and Sequential Minimal Optimization (SMO). J48 generates a decision tree based on information entropy. Naive Bayes is a probabilistic classification algorithm that makes use of Bayes' theorem. The sequential minimal optimization (SMO) algorithm is an algorithm for efficiently solving the optimization problem that arises during the training of support vector machines. Sets of 50, 100, 150, 200 and 300 movie synopses were extracted from IMDB to serve as the training data. To test the accuracy of the three models, another set of 20 movie synopses were extracted and used as test data.

025 - Exploring Avenues for Community Informatics in Philippine MSME

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Economic growth in the past century has resulted to high living standards and the spread of modern technology in an unprecedented rate. However, this same growth has resulted to phenomenal gaps between the rich and the poor. Indeed this calls for a new paradigm in looking at the challenges posed by societal development. Recognizing the importance of inclusive growth, the need for equitable diffusion of development benefits and access to resources are factors that must be considered. This penchant for inclusive development highlights the valuable role of information resources and Information & Communications Technology (ICT) in achieving a truly inclusive society. Here thus lies the challenge of ICT adoption and ensuring productive utilization of such resources for increased productivity. In the Philippines these challenges related to ICT adoption and utilization can be seen in MSMEs. Regarded as enablers for economic growth, the utilization of ICT to induce productivity remains a daunting challenge for majority of MSMEs. Using structuration as its research paradigm, the study will examine the dynamics of ICT adoption and utilization in selected MSMEs located in Meycauayan, Province of Bulacan. The study will utilize the concept of community informatics in identifying new avenues for the adoption and utilization of ICT in MSMEs.

026 - Shear Strength Characteristics of Some Mine Tailings in the Philippines

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Philippines is known to be gifted with vast amount of minerals but extracting these minerals will produce enormous waste materials called mine tailings which are considered to be valueless. Tons of mine tailings are contained in dams which serve no purpose and could pose as threat if ever dam failures would occur. It is the interest of this paper to determine which among the Negros Oriental copper mine tailings, tailings from aggregate quarry in Cavite and Davao gold mine tailings possess strength parameters which may serve as construction materials in order to minimize the threats that the mine tailing would produce. With this, three types of triaxial tests, unconsolidated undrained test, consolidated undrained test and consolidated drained test, were conducted on the mine tailings in the determination of the shear strength and the critical state parameters. It was found that the Tailings from Aggregate Quarry in Cavite has the highest strength parameters which ranged from 51.44 kPa - 275.86 kPa for its undrained shear strength and 34.71° - 42.13° for its critical angle of internal friction. On the other hand the Davao gold mine tailings' undrained shear strength ranged from 34.94 kPa – 230.23 kPa and its critical angle of internal friction ranged from 29.91° - 38.29° . While Negros Oriental copper tailings' undrained shear strength ranged from 42.42 kPa – 117.75 kPa and its critical angle of internal friction ranged from 22° - 28.28° . After determining the shear strength parameters, state paths were obtained. The state paths were used to determine the critical state line and the critical state parameters, r , κ , λ and N_p , of each sample. These were applied in the Cam clay model to predict the stresses the samples had experienced. The stresses within the yield locus represent the elastic state of the sample while stresses beyond it were considered to be at its plastic state. It was determined that the critical state parameters were dependent upon the stresses experienced by the samples. Among the three mine tailings, Tailings from Aggregate Quarry in Cavite is considered to be the most suitable tailing which may be used as construction materials.

028 - Extracting Keywords from Text Documents Based on High Level Word Features

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Aside from their obvious use in the browsing of document collections and archives, keywords are also often the basis for various text processing methods such as clustering and retrieval. Common keyword extraction methods use complex structural and semantic analyses that require a significant amount of computation time, and are often domain dependent. Statistical methods that use term frequency features (tf-idf), on the other hand, are good alternatives but can still tend to be slow because such features can only be computed once the term frequencies of all the words in all the documents have been counted. This work reports experimental results on the use of computational intelligence techniques that extract keywords based on high level word features other than tf-idf. These word features include position features such as location of the word in the document, paragraph, or sentence, as well as usage features such as whether the word is used in the abstract, section headings, and figure captions. Additional word features for future work may include format features, such as when a word is printed in bold face, italicized, underlined, or when the font size is larger than the rest of the document. Using title words as proxies for the correct keywords, back-propagation neural networks were trained. Prediction f-measure rates reach 0.88 for a collection of IEEE journal articles, and 0.78 for a collection of Reuters news articles. In addition, using the Re-RX algorithm to extract rules from the trained back-propagation networks, as much as 0.83 of the 0.88 f-measure for the IEEE Journal dataset was found to

be attributable to the high level word features that do not have anything to do with the term frequencies.

029 - Electromyogram-based Robotic Arm Controller

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This study aims to create a prototype for an EMG-based robotic arm controller. Designing machines which detect biosignals to control external mechanisms can lead to significant breakthroughs especially in rehabilitation medicine and prosthetics. The design uses sensor pads placed on target muscles to detect the necessary biosignal for conditioning and conversion to an equivalent muscle force. The muscle force is then translated into a trajectory parameter to make the corresponding robot link move. The entire system is governed by a LabVIEW based software which gathers the EMG data and sends out movement signals to the CRS robot arm controller. A GUI is also present which illustrates the EMG graphs and force of flexion equivalent. The results of experiments conducted on the prototype shows that the desired robot movement based on the target muscle is successful at least 80 percent of the time.

030 - Social Innovation and Community Informatics: Charting New Directions in ICT4H for Maternal and Child Healthcare

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Achieving the Millennium Development Goals (MDGs) remains a daunting challenge for the Philippines. The WHO (2004) estimates that 11 Filipino women die every day due to pregnancy related complications. This phenomenon is widely attributed to the inequitable access to health services and education. Stressing the need to prioritize universal access to health services especially for the marginalized, the Aquino Health Agenda (2010-2016) highlights the need to specifically address the challenges posed by maternal health and child mortality through a resource-oriented, State-led approach. However, due to the complex and persistent nature of these challenges, the paper calls for a new paradigm, a holistic approach that subscribes to the tenets societal inclusion and the transformational role of ICT. Adhering to the e-Transformation concept of treating information as resources and ICT as enabling tools along with social cohesion and collaborative approach at the grassroots, the paper uses the concepts on social innovation and community informatics to understand the dynamics of maternal and child healthcare in local communities. Furthermore, the study intends to uncover the dynamics of community practices on maternal-child health and through a deductive research approach, identify possible avenues for ICT for Health (ICT4H) applications to stimulate systematic social change for the common good.

031 - A Study on the Use of Expanded Polystyrene as a Substitute for Fine Aggregates in Concrete Hollow Blocks

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Polystyrene is one of those materials that people come across in their everyday lives; it comes in the form of a white bulky mass which is called Styrofoam. However, disposing polystyrene is a big problem since it is made of petroleum, a non-sustainable and heavily polluting resource, which makes

polystyrene a product that cannot be incinerated. The recent means of disposing polystyrene is by recycling or dumping. In any case, recycling polystyrene has a very little market all over the globe and is not currently available in the Philippines. According to a polystyrene fact sheet, 25-30% of landfills are composed of polystyrene products which in time may continue to increase to a much bigger number. This study was dedicated to introduce a new innovation in disposing polystyrene wastes by making it as a substitute material to fine aggregates in concrete hollow blocks. In achieving the purpose of the study, test specimens with polystyrene was tested by means of direct load application or compression test. This study proved a new way of disposing polystyrene and knew its effect when substituted to concrete hollow blocks regarding its compressive strength and weight, which decreases as the percentage of polystyrene increases. The specifics obtained from the study were analyzed and shown through graphs and tables; the results from the laboratory tests were compared to that of the control specimens, and which among these specimens are nearest to the acceptable compressive strength for commercial hollow blocks. The study produced the best possible polystyrene added mix with 20% polystyrene substitution which had a strength capacity of 2.052 MPa and density of 1653 kg/m³ attaining the nominal acceptable strength capacity of non-load bearing concrete hollow blocks stated in PNS 16:1984, as well as producing a lightweight hollow block having a density which was less than 1680 kg/m³, a standard which was set by ASTM C-129.

032 - A Neighborhood Search Heuristic for Parallel Identical Machines Minimizing the Number of Late Jobs and Maximum Lateness

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Scheduling Jobs on identical parallel machines to simultaneously minimize the number of late jobs and maximum lateness of any job is NP-hard (Pinedo, 2002) and hence, warrants the development search heuristics that generate near-optimal but acceptable schedules. This problem is similar to how air traffic controllers sequence landing of several airplanes requesting airport services: each flight would selfishly seek to be on time, or to be closest to the appointed arrival time (minimal lateness) independent of all other flights' knowledge of overall tardiness, while the controller seeks to minimize the number of late flights. This paper builds on the Longest Processing and Delivery Time (LPDT) algorithm developed by K.Li, S.L.Yang and H.W.Ma (2011), improves it through an understanding of the machine scheduling problem structure, and finally proposes a neighborhood search heuristic to build forward sequences on the parallel machines. Through comparison of worked examples of the problem using the proposed heuristic and complete enumeration of possible sequences, the performance of the heuristic will be shown to work at par if not better than K.Li et al's (2011) approach and generates schedules that is as close as possible to the optimal schedule as may be found by complete enumeration.

034 - Kape Alamid: Is It Really Different?

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Civet Coffee, more popularly known in its Indonesian name as *Kopi Luwak*, has a gained good following despite being arguably the most expensive coffee in the world, at anywhere between 5 to 20 times the cost of its regular counterpart. In the Philippines, *Kape Alamid*, as it is locally known, is being sold as finished-product roasted beans. However, there is a concern about whether the aroma profile of this kind of coffee is indeed worth its cost. Gas Chromatography-Mass Spectroscopic method was thus applied in analysing the aroma compounds of coffee varieties and their civet counterparts. To determine

whether the Composition Data from the Civet sample and the Non-Civet Sample have a significant difference between them, data was ran on T-Test for Independent Sample Analysis. Each blend was taken individually as well as the Roasting Process it underwent. Concentrations were tested against each other without regard for the concentration Functional Groups. All p-values obtained are bigger than the set critical alpha; therefore, for all conditions, the null hypothesis should be accepted. There is no significant difference between Civet and Non-Civet Compositional Concentrations.

035 - Evaluating e-Government Initiatives: Exploring the Applicability of an e-Government Scorecard for MLGUs

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A daunting challenge for the Philippines is the current thrust to achieve its development agenda, wherein the drive towards good governance is viewed as one of the cornerstones for achieving inclusive growth. A central theme in this reform effort is ensuring equitable access to government services. Enshrined in the Local Government Code of 1991 (R.A. 7160) and the e-Commerce Act of 2000 (R.A. 8792), this brings forth new responsibilities resulting to the constant challenge of ensuring adherence to the tenets of good governance and societal inclusion. Parallel with this emphasis is the growing recognition of the importance of utilizing ICT to ensure access to government services. Thus the practice of e-Government is recognized as a venue to achieve its goals for bureaucratic reform. However, in spite of the potentials of e-Government, there are increasing concerns about the failure of numerous e-Government projects to achieve its desired goals. This concern is accompanied by a clamour to device an approach to assess-evaluate e-Government services. This paper will explore the applicability of developing an e-Government scorecard for MLGUs. Subscribing to qualitative-descriptive research methodology through a deductive approach, the paper intends to identify the dominant factors that support and hinder e-Government initiatives in MLGUs.

036 - Ambulatory Electrocardiogram Synthesized with Instantaneous Data Transfer via SMS

Jan Patrick Baylon, Jose Bayani Castro, Carl Erickson Lim, Maria Cristina Victoria Rodriguez and Homer S. Co

Manufacturing Engineering and Management Department, De La Salle University

Heart disease has been the leading cause of death not only in the Philippines but around the world. People with heart diseases need a technology which can help them with their condition. Technology today can now address the demand of having devices which can help in the diagnosis and monitoring of such diseases in a faster pace. This study focuses on the design and fabrication of the Ambulatory Electrocardiogram Synthesized with Instantaneous Data Transfer via SMS. The device has three major components working together. First, the electrocardiogram amplifier. Second, the microcontroller which is the central part of the system. Lastly, the GSM module which is used to send the data. The device can retrieve the heart's electrical activity by means of an electrocardiogram. Three electrodes are placed onto the user's body, two electrodes on the chest and one electrode on the right leg for grounding. The heart's electrical activity is magnified and filtered by the electrocardiogram amplifier then the analog data is converted to digital output. The PIC16F877A microcontroller stores the data gathered and then transmits it to the GSM module to be sent to the MS Excel capable mobile phone. The receiver then plots the sent data into the MS excel application to see the electrocardiograph. The device can also be connected to a personal computer or notebook for the option of seeing the electrocardiogram readings in real time.

038 - A Study on Different Concrete Plastering Materials

Catherine Chan, Jennifer Santos, Alex We, Ronaldo Gallardo, and Jason Maximino Ongpeng
Civil Engineering Department, De La Salle University

Cracking of plaster is a major problem encountered by engineers. Its prevention and control would lead to high financial savings in construction. This study focused on the properties of plastering materials and the nature of cracking in plaster layers. The main objective is to evaluate the effects of the properties of each of the plastering materials studied in surface cracking. Four types of commercial plasters were compared with four mortar plasters having different mix designs. Standard cube test specimens were used and evaluated based on density, workability, cost, and crack propagation. ASTM standards were followed for the compressive strength and drying shrinkage of the plastering materials. The general observations obtained from the series of experiments were: (1) Mortar plasters are better in terms of compressive strength, workability, and cost; (2) Commercial plasters perform better in terms of drying shrinkage and density. A point system was created in determining which among the eight types of plasters performed best. As a result from the ranking, three out of four commercial plasters belonged to the top five performing plasters and the best performing plaster was a commercial plaster. Laboratory results also showed consistency with the cracking degree of the plasters.

039 - A Study on the Use of Expanded Polystyrene as a Substitute for Fine Aggregates in Concrete Hollow Blocks

Nico Lauren Andrew Aguilar, Jose Enrique Octaviano, Timotei Martin Santiago, Ronaldo Gallardo, Jason Maximino Ongpeng, Cheryl Lyne Capiz
Civil Engineering Department, De La Salle University

Polystyrene comes in the form of a white bulky mass called Styrofoam. Disposing polystyrene is a problem since it is made of petroleum, a non-sustainable and heavily polluting resource, making it a product that cannot be incinerated. Recent means of disposing polystyrene is by recycling or dumping and due to this; 25-30% of landfills are composed of polystyrene products which may increase over time. This study aimed to introduce a new innovation in disposing polystyrene wastes by making it a substitute material to fine aggregates in concrete hollow blocks. Specimens with polystyrene were tested by means of direct load application or compression test. The study produced the best possible polystyrene added mix with 20% polystyrene substitution which had a strength capacity of 2.052 MPa, attaining the nominal acceptable strength capacity of non-load bearing concrete hollow blocks as stated in PNS 16:1984. The corresponding density is 1653 kg/m³, thus, producing a lightweight hollow block having a density which was less than 1680 kg/m³, a standard which was set by ASTM C-129. The outcome of this research proved to be beneficial to the environment by introducing a new way of disposing polystyrene.

040 - Corrosion Risk Assessment of Reinforced Concrete Columns through Half-Cell Potential and Carbonation

Christian Paolo Arcinue, Ivan Nico King, Jasper Ivan Lim, Ronaldo Gallardo, and Cheryl Lyne Capiz
Civil Engineering Department, De La Salle University

Corrosion of reinforcement has been established as the predominant factor causing widespread premature deterioration of concrete construction worldwide, especially on structures located in a tropical country like the Philippines, where climatic conditions favors carbonation. Half-cell potential measurements are simple, inexpensive and virtually non-destructive techniques to assess the corrosion risk of steel in concrete. This study reports a practical application of half-cell potential measurements and carbonation depth measurements on three distinct school buildings in Tayuman, Manila. Results

from the half-cell potential measurements showed that all of the buildings tested have low risk of corrosion. The most corroded steel bar obtained from the tests was not even close to the range of the intermediate risk of corrosion. In addition to this, the carbonation depth results showed that carbonation has not reached the steel reinforcements of all the columns tested. This may be the reason why all of the columns tested showed low risk of corrosion. Results of this study can be used to easily detect the corrosion stage of structures so that appropriate actions can be made.

042 - Portable Heart Monitoring System

N.T. Bugtai, S.U. Chan-Siy, J.E. Chua, J.A. Flores and J.L. Wang

Manufacturing Engineering and Management Department, De La Salle University

Coronary heart diseases are one of the most common causes of fatality. Most heart attacks occur as a result of these coronary heart diseases. The need for a precautionary device that is able to monitor a person's critical vital signs arises. Portable Heart Monitoring System is able to arise to such demands. The device monitors the wearer's critical vital signs such as electrocardiograph (ECG), heart rate and body temperature. Physiological limits of normal heart rate and temperature values are set into the device in order to recognize the normality of the vital signs being acquired. In the event that values exceed the physiological limits set into the device, an alarm is automated to sound to be able to alert the wearer as well as the people around him of the abnormal vital signs being experienced. ECG cables are embedded into a vest worn by the wearer so that ECG signals would have more stability with the ECG cables decreased mobility. Three electrodes in contact with the wearer's torso are used to detect the electrocardiograph signals. The heart rate is then taken from computation of the distance between R-peaks of the electrocardiograph signals. The temperature is taken with the LM35 in contact with the wearer's armpits. A Z8 Encore Microcontroller processes the data and converts the signal to be fit for output on a liquid crystal display (LCD) touch screen incorporated into the device. The device's display shows the ECG signal, updated every 3 seconds, the heart rate computed from the ECG signals and the real-time reading of the body temperature of the wearer. The device is able to display monitoring-quality ECG signals with consistency, showing noticeable peaks used by doctors for study and diagnosis. The digital thermometer and heart rate monitor is capable of achieving an accuracy of up to 98% with a confidence level of 95%; alarm component is sensitive to triggers and is activated immediately when pre-set limits are exceeded.

043 - Digital Asset Management System

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Information Technology Department, De La Salle University

The Digital Asset Management System developed for De La Salle Lipa (DLSL) is a project centered on the creation of an internal system that would help the students in the repurposing of their thesis documents. The main objectives are catered to help DLSL in the management of their students' thesis documents and to effectively circulate and share these documents to the whole academe. The main problem addressed in the development of this system is DLSL's lack of monitoring and the ineffective dissemination of their theses research content. The methodology applied in the development of this system is Rapid Application Development (RAD) due to the time constraints experienced by the development team. By adapting to this methodology, the team was able to deliver a working prototype of the system while constantly implementing changes requested by the end users. The system acts as a facility for knowledge sharing by effectively circulating thesis documents while ensuring the accuracy and integrity of data. In this day and age wherein digitalization is starting to proliferate and fast becoming a trend, DAMS is guaranteed to maintain technological leverage and keep up with other

emerging technologies. The team's goal was to provide DLSU with a system that would greatly improve the management of their thesis documents and to present their students with a facility that would allow them to make use of research materials that are available to them, but not always accessible. The team believes that an effective means of research is a right and privilege of any student. With this being said, the team hopes that the proposed DAMS would act as a gateway for future systems to be developed that would cater to a much larger scale of market and present an avenue for further learning.

044 - Prelude to an eParticipation Framework for Peacebuilding

Louis Mark N. Plaza and Sherwin E. Ona

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Armed conflict is a developmental problem in any nation as it has numerous repercussions on the moral, economic and security structures of the society. In the Philippines, a four-decade war between the Government and the Moro Islamic Liberation Front (MILF) continues to persist. Peace negotiations between the two parties have been put into place since the 1960's but in ensuring people's accountability and sense of ownership of the peace process, the following gaps have been identified: (1) the participation of some stakeholders are overlooked, (2) lack of availability and accessibility of information on the peace process and (3) no concrete initiatives from the government to promote and encourage public participation. A movement to address these gaps involves the active cooperation of the various stakeholders in Lanao del Norte, Mindanao, Philippines. This effort is known as Participatory Development. It is seen in the conduct of peacebuilding activities, particularly community dialogues, to respond to this developmental problem. This study attempts to explore the role of Information and Communications Technology (ICT) in enhancing and improving participatory development through eParticipation by (1) identifying the participating stakeholders, (2) mapping eParticipation models against existing practices and (3) evaluating the participatory techniques across the series of community dialogues. This study will focus on the community dialogues (December 2010 to August 2011) conducted by the Institute of Peace and Development in Mindanao and its partner civil society groups in Lanao del Norte. Data were gathered through document review, key person interview and participant observation. The three characteristics of participatory development, namely, multi-sectoral process, engagement and decision-making, were identified prior to the data collection and regarded as the units of analysis. A case study will be presented to compare the predetermined characteristics to the existing practices in the community dialogues. In addition, there will be a discussion on the preliminary issues and constraints on the assumption of having an ICT-aided community dialogue. All these results serve as a prelude to the creation of an eParticipation framework for peacebuilding.

045 - Supply Chain Information System

Mary Jane B. Arcilla, Mary Catherine Loquinario, Leonard Gerome Reyes, Anton Tyrone Rodriguez, and Chloe Sytiong

Information Technology Department, De La Salle University

Information Technology (IT) has been playing a big role in supporting the business processes of organizations. One of the business processes that reaps the benefits of IT is the supply chain. This paper aims to show how a Supply Chain Information System (SCIS) was able to solve the delays in the supply chain process of Primer Group of Companies that led to the company's loss of sales. SCIS allows the different users of the system to create and pass information through the Web. It helps the entities involved in the supply chain process in decision-making in terms of product allocation which is critical in the process. Moreover, the system allows communication among all the entities involved for faster transfer of data and information. The Waterfall methodology was used since it allows the proponents to

analyze and develop the system sequentially. Each phase was to be completed before the next phase is done. The advantage of the waterfall model is that it identifies the system requirements long before the system is developed or programmed and only minimal changes were made as the development of the system proceeds. Through the waterfall methodology that was used, the proponents did not have a hard time in developing the system and meet the user requirements.

046 - Network Controlled Mobile Robot with Vision

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This paper presents the development of a network controlled mobile robot that will enable us to engage in high level mobile robotics research with significant reduction in experimental platform cost. The study involves the mechanical design of the mobile robot based on the desired kinematics and dynamics. An RTOS base program was developed which will be responsible in generating real-time clock to be used by the motion control algorithm. The experiments show that the linear position accuracy test, velocity test and fixed coordinate test have errors of 0.89%, 4% and 0.29%, respectively. Finally, a vision sensing system was created to show the flexibility of the mobile robot.

047 - Epidemic Decision Support System

Mary Jane Arcilla, Kenneth Chan, Joanne Lee, Ken Sotamco, and Lawrence Tan
Information Technology Department, De La Salle University

Disease surveillance is considered to be a vital element to public health security and decision-making. Information gathered through these surveillances is essential to the development and creation of necessary health programs and actions. But as the world revolves towards the future, impending epidemics also evolve and become more fatal to mankind. Millions of lives are taken by diseases due to the incompetency to implement well-managed disease surveillances, and the failure to deploy the appropriate preventive measures and health responses. However, with the assistant and use of today's technology and innovations, man can truly strive and decrease the chances of an outbreak. On the other hand, if an outbreak does occur, health officers can immediately response to such event. The use of the Epidemic Decision Support System can potentially give way to the emergence of a well-managed surveillance system which can integrate disease surveillances on different scales of areas. With this Information System, report generations and information dissemination are taken towards the next level, keeping up with the continuous development and trends of diseases. The consolidation and combination of past data and present data are also done easier with the use of the EDSS, allowing officers to view system generated suggestions regarding a health event thus making their decision-making processes easier. And with the implementation of the Epidemic Decision Support System, disease cases can definitely be controlled, monitored, and prevented straightforwardly.

048 - Using of Brainwaves to Classify Emotion

Janelyn Co, Cheney Samson, Justin Uy, Rhia Trogo and Merlin Teodosia Suarez
Software Technology Department, College of Computer Studies, De La Salle University

This research focuses on getting the emotion of a subject using the electroencephalograph signals of an inhabitant. The International Affective Picture System (IAPS) was used to elicit emotions from the subject. The subject was asked to view the pictures in IAPS for five seconds each. The subject is asked to look at blank slides in between slides to establish baseline again. HOC and statistical features were used

to extract features from the brainwave signals. These were used to build a classifier that identifies the emotion of the person. The emotion in this research was classified based on valence and arousal. Separate models were built for valence and arousal and there were three gradients used for labels, high, medium and low.

049 - Retrofitting of RC Columns with Steel Fiber Reinforced Mortar

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Civil Engineering Department, Gokongwei College of Engineering, De La Salle University

Jacketing is a common engineering practice in retrofitting of deteriorated RC columns. In this study, the proposed method of jacketing is through the use of mortar plaster reinforced with steel fiber. The effect of the amount of the steel fibers on the load carrying capacity of the column is the main focus of the study. The study has considered RC column specimens with 120 mm x 120 mm cross-section and coated with a 10 mm thick plaster or jacket. The jacketing material consisted of Steel Fiber Reinforced Mortar (SFRM). Three volume fractions of SFRM were considered, specifically 1%, 2%, and 3%. Through concentric compression test, these jacketed columns were loaded until failure. The load, strains, displacement, and failure modes were monitored during the test. The load resisted by a column may be broken down into loads carried by three materials namely: concrete, steel, and SFRM. The corresponding load carried by each material was evaluated. Since, the computation does not include the confinement effect, the actual load resisted by the column subtracted by the calculated unconfined load contribution of each material quantifies the confinement effect. Analysis of the data shows that at 1%, 2%, and 3% volume fractions had respectively increased the load carrying capacity by 34.2%, 48.7% and 18.2% when the column is resisting a total load of 150 kN; 33.8%, 49.8% and 22.1% when the column is resisting a total load of 250 kN; 9.0%, 45.5%, and 12.7% when the column is resisting a total load of 350 kN. The strains of the lateral ties at 2% SFRM retrofitted columns were significantly greater than that of the other volume fractions which may indicate that confinement of the lateral ties is more active at this volume fraction. Furthermore, based on the test results, 2% SFRM retrofitted columns have the greatest average increase in compressive strength.

050 - Effectiveness of Lightweight Concrete as Protection of Steel Reinforcement Against Elevated Temperature

Bernardo A. Lejano, Xavier S. Lim, Edmund C. Cheung, and Frederick C. Lim
Civil Engineering Department, Gokongwei College of Engineering, De La Salle University

Reinforced concrete may be exposed to very high temperature either accidentally or intentionally, such as during a fire, or when it is used in a furnace or other heated areas. This study is about the effects of elevated temperature on steel reinforcement embedded in lightweight concrete. The study also investigated the performance of lightweight concrete as compared to normal-weight concrete when exposed to very high temperature. Mt. Pinatubo aggregates were used to come up with lightweight concrete with a design-strength of 21MPa. A total of 9 concrete cylindrical specimens and 12 rectangular reinforced concrete prism specimens were cast and cured for 28 days. Prisms contained steel reinforcement of diameter 8, 16, and 25 mm. The steel was provided 40 mm concrete cover. Concrete specimens were heated to 900°C for 1, 2, and 3 hour duration at the Heat Treatment Facility of MIRDC, DOST. The prisms were crushed to retrieve the steel reinforcement for tension testing. The data obtained from the testing of steel reinforcement were analyzed and compared to that from the study of Ong et al (2006) for normal weight concrete. Data for comparison included yield and tensile strength of steel reinforcement and compressive strength of concrete. Findings revealed that the effect of elevated temperature on compressive strength of concrete is the same for lightweight concrete and normal

weight concrete. After heating to 900°C, the remaining strength of concrete was only 9.8% and 10.9% for lightweight concrete and 10.9% for normal weight concrete, respectively. However, the ability of lightweight concrete to protect steel reinforcement was significantly higher than that of normal weight concrete. This was reflected with losses on yield and tensile strength of 12.8% and 6.6% respectively for 16 mm steel reinforcement in lightweight concrete, as compared to 36.6% and 30.1% respectively in normal weight concrete. In addition, yield and tensile losses for 25 mm steel reinforcement in lightweight concrete incurred 8.2% and 8.9% respectively as compared with 21.6% and 18.7% respectively from normal weight concrete. A formula for calculating the decrease in strength of the steel reinforcement as affected by elevated temperature is proposed.

051 - Quantum Transport Properties of SWBNNT with Point Defects using Nonequilibrium Green's Function (NEGF) Formalism

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We report an *ab-initio* quantum transport study of single-walled boron nitride nanotubes (SWBNNTs) with point defects under the effect of an applied finite bias voltage. An SWBNNT is sandwiched between two semi-infinite gold electrodes and the contact current is calculated using nonequilibrium Green's function (NEGF) in the Landauer-Buttiker equation. Our method is based on density functional theory which is executed in Vienna Ab-initio Simulation Package (VASP) with codes extended to accommodate the nonequilibrium nature of the system under investigation. In the calculation process, we divide the system into three parts: the left and right electrodes, and the central (SWBNNT) part. In this division, the screening approximation is employed in which we assume that the electrodes are not perturbed and that inside deep solids the Kohn-Sham (KS) potential approaches the bulk potential. For the calculation of other equilibrium quantities like charge densities, local density of states (LDOS), etc., we solve Poisson equation with proper boundary conditions to obtain the Hartree potential which is then added to the exchange-correlation potential to solve for the Hamiltonian of the device. This Hamiltonian together with the bulk Hamiltonian of electrodes is used to solve for the NEGF of the system and compute the density matrix. From the density matrix, charge densities and LDOS are obtained. It is understood that since the equations for Keldysh Green's Function and density matrix are coupled, the computation is carried out in a self-consistent manner. The results of the study will further strengthen the role of SWBNNTs in nanoelectronics as potential nanotransistors.

052 - Quantum Dynamics Study on Atomic Hydrogen Adsorption and Desorption on/from Graphite via the Armchair Edge

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Hydrogen storage in a carbon material is more advantageous than other materials because of its low mass density. Initial experimental studies on hydrogen storage in carbon nano-materials show promising results, indicating high hydrogen storage capacities (more than 60 wt% in some cases). However, the more recent experimental studies using different methods and on various carbon nanostructures show less encouraging results with a large variation in the amount of hydrogen stored. Thus, there is a need for more systematic investigations to gain a detailed, atomic-level understanding of the mechanism underlying hydrogen adsorption, absorption, and desorption on/from carbon related materials such as graphite. This study investigates the quantum mechanical behavior of the adsorption

and desorption of hydrogen atom on/from graphite via the armchair edge. The adsorption and desorption probabilities of H are calculated using the coupled channel method via the Local Reflection (LORE) matrix. The available potential energy surface (PES) calculated by Arboleda et al. is used in the calculations. The probabilities are then plotted against the initial translational energy of H. The range of the initial translational energy E_t is 0.0-1.2 eV (0.0-4.5 eV) for the adsorption (desorption) of H, with an interval of 0.001 eV (0.0015 eV). For the piecewise constant potential approximation, the area under the potential curve is divided into 100 sub-regions. The adsorption probability plot shows a non-activated reaction indicating that hydrogen is easily adsorbed on the surface of the graphite sheets. The desorption probability plot shows that desorption of H from the graphite sheets is an activated process with a barrier height of 4.19 eV. Due to this high barrier, desorption of the absorbed H atom from the surface of the graphite sheets at operating temperatures (300 – 1500 K) of conventional fuel cells is unlikely to occur.

054 - A CMOS Design of a Controller for a 5V to 3V DC-DC Buck Converter

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In this paper, we present architecture for a CMOS analog controller intended for driving a 5V to 3V, DC-DC Buck Converter using Pulse Width Modulation (PWM). The controller design starts with a 2 stage, P Channel Input - CMOS operational amplifier. The amplifier was subsequently used for the design of a Proportional Integral Derivative (PID) controller, an error amplifier and an analog voltage controlled digital clock circuit. The whole system is implemented using 0.35 μ m, 5V library. The converter can regulate an input voltage range of 3.5V to 5V and a load size as low as 1K ohms.

056 - From Solutions of Games to Codes

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For any cooperative game, the interest is on solutions which define a way of allocating the total reward once the grand coalition is formed. These solutions are usually determined based on some desirable features that intend to maximize the profit that each player gets by joining the grand coalition. For a game with characteristic function v and player set $N = \{ 1, 2, \dots, n \}$, it is customary to require an allocation $x = (x_1, x_2, \dots, x_n) \in R^n$ to satisfy the efficiency ($\sum_{i=1}^n x_i = v(N)$) and individual rationality ($x_i \geq v(i)$ for all $i \in N$) requirements. With this in mind and other additional desirable features, one can construct a code structure whose distance function can be defined in an unconventional manner. In this paper, we discuss such construction and investigate on the properties of a new code C_v derived from the game v via the use of solution concepts.

057 - Exploring the Applicability of Communities of Practice for Network Organizations in Disaster Management

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Recent disasters cause the destruction of communities, death of millions, and collapse of people's livelihood. In light of this, the Hyogo Framework for Action and the Disaster Risk Reduction and Management Act of 2010 stress the importance of disaster preparedness through knowledge management and communities of practice. These emerging trends led to the creation of network organizations that facilitate disaster preparedness activities for local communities. However, the

challenge is for practitioners to find a reasonably grounded and practically applicable theoretical foundation for developing and evaluating knowledge management process, IT applications and Knowledge management systems (Cecez-Kecmanovic, 2004). With this in mind, the objective of the study is to create a Communities of Practice (COP) Framework using ICT in the area of disaster preparedness for network organizations. It also explores the role of ICT in the area of communities of practice in disaster management. To achieve the aim, the proponent will use hybrid approach of grounded theory and Checkland's soft systems methodology to discover themes and patterns that will produce a basis for private sector network organizations in evaluating their existing Communities of Practice activities. As a result, the framework aims to improve COP activities conducted by network organizations and contribute to the fields of research, innovation and the overall disaster risk reduction initiatives worldwide.

059 - Solvent Free Microwave Extraction of Oil from Kenaf Seeds and Study on its Dielectric Properties

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Nowadays, the production of biodiesel is becoming more popular and gathering significant attention from the scientific community because of its advantages compared to diesel fuel. Biodiesel is derived from oils from plants or animal fats; therefore it is readily available and renewable. One of the candidate feedstock that is being studied at De La Salle University-Manila for biodiesel production is *Hibiscus Cannabinus L.* or commonly known as Kenaf. Biodiesel production from the seeds of Kenaf by microwave irradiation has come a long way in its development but like many other studies, further research has to be done in order to make the process more efficient. This study focuses on the determination of the dielectric constant and loss factor of Kenaf seeds, with varying moisture content and frequency, and also the solvent free microwave extraction of the seeds. The dielectric properties were measured using the parallel-plate capacitance method. The oil yield was also tested for its properties such as moisture content, acid value, glycerol value and oxidative stability. The dielectric properties were determined at a frequency range of 1 - 100kHz and graphs produced were all asymptotic. Results show that the moisture content and frequency greatly affect the dielectric properties of the seeds. The dielectric properties are directly proportional with moisture content, while inversely proportional with frequency. The correlation between moisture content and dielectric properties was also established for easier approximation in the frequency range. The seeds having its natural moisture content of 9.26% yielded a dielectric constant of 2.2 while it went up to 79.48 at 22.37% moisture which is comparatively desirable due to the fact that it is close to another seed's dielectric constant which was already used for a solvent free microwave extraction procedure. The dielectric loss factor was found to be 0.27 at the seed's natural moisture but this was easily elevated to 1.751 through moisture elevation.

060 - Saccharification of Microwave Pre-treated Kenaf (*Hibiscus Cannabinus*) Bast Fiber Using Carabao Rumen Fluid

Isobel Rae S. Impas, Rachiel Ruth C. Tan, Mark Reinhard P. Young, and Florinda T. Bacani

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The excessive use of fossil fuels causes fuel depletion globally and along with it, the harmful effects of using fossil fuel are becoming more evident nowadays. As a solution to this problem, bioethanol has been found to be one of the main components for producing biofuels. The production of cellulose

ethanol as an alternative source of fuel energy is now possible due to the various studies made to lessen our dependence on fossil fuels. This study focused on utilizing rumen fluid found in ruminants containing microorganisms that secrete enzymes that are capable of hydrolyzing lignocellulosic material and convert them to simple sugars. To establish its capability to convert fibers into sugars, the need for further investigation is needed. To further increase the yield of fermentable sugars, the process of microwave pre-treatment was used to test its capability to delignify the fiber. Rumen fluid, the fluid responsible for the degradation of feeds in ruminants such as Carabaos is now one of the breakthroughs in enzyme hydrolysis due to its ability to saccharify lignocellulosic biomass. In this study, rumen fluid was used as the source of enzyme for saccharification of Kenaf bast fiber (KBF). Furthermore, this study introduced microwave pre-treatment as its primary pre-treatment method. Experiments were conducted to obtain the best values of the rumen fluid and substrate concentrations which were found to be 3% (v/v) and 10 g/L respectively among values of 1%, 3%, and 5% (v/v) for enzyme concentration and 10, 20, and 30 g/L for the substrate concentration. Process parameters for microwave pre-treatment were identified to be the irradiation time and fiber concentration. 3^2 factorial design was used with parameter values of 10, 20, and 30 minutes irradiation time and 20, 30, 40 g/L fiber concentration. The highest sugar yield was found when irradiation time is 10 minutes with fiber concentration of 20 g/L with the value of 0.0318 g total sugar per gram Kenaf bast fiber, 3.83% higher than the untreated fiber.

061 - Triangle Mesh Shell Voxelization Using Primitive Intersection Tests for Lego Brick Approximation Algorithm

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The Lego Brick Approximation system by Bautista (2007) automatically generates a virtual Lego model made up of Lego bricks from a given input 3D mesh. The system temporally struggles when generating a highly detailed virtual Lego model as it executes serially on the CPU. To address this problem, we developed a new algorithm amenable to execution on the CPU and on other compute devices such as GPUs that support parallel execution. The original system is divided into two major algorithms, namely, Voxelization and Legoization. Voxelization is computationally expensive and uses device specific library functions. It will be superseded by the proposed algorithm which is more flexible since it consists of mathematical equations for data processing rather than helper functions. The new Voxelization algorithm consists of four intersection tests on vertices, edges, triangles, and axis aligned bounding boxes (AABB). The first test checks if a vertex in the mesh is contained in a voxel unit (a value on a regular grid in 3D space); if so the voxel will be added to the voxel model which is a collection of voxel units representing the mesh model. The next three tests are dependent on each other and works on the triangles in the mesh. The second test checks if the AABB of a triangle intersects with a voxel; the third checks if a voxel intersects the plane where the triangle lies, and the last test checks the axes perpendicular to the paired edges of the voxel and triangle. The algorithm was implemented and currently executes as a sequential program on a CPU. The test results obtained using the Bunny and Dragon models encouraging even with just a CPU sequential execution. In the next stage of our research, we will design and implement the algorithm on a GPU using OpenCL. We expect to have significant performance speedup when algorithm gets to execute in parallel.

062 - Morphology of Spin Coated YSZ Thin Films on Silver Substrate

Shirley Tiong Palisoc, Rose Ann Tegio, Michelle Natividad, Simon Gerard Mendiola, Benjamin Tuason, Kevin Kaw, and Stephen Tadios

Materials Science Laboratory, Physics Department, De La Salle University

Different concentrations of yttria stabilized zirconia (YSZ) grown on silver (Ag) substrate was investigated in this paper. Suspension containing 10wt%, 30wt% and 50wt% YSZ were fabricated using the spin coating technique on silver keeping all other parameters constant such as the coating parameters and sintering temperature. The surface morphology and thickness of the films were investigated using scanning electron microscopy (SEM). Results showed porous YSZ films which become less porous as the concentration of YSZ increases. The thickness of the films was also affected by the YSZ concentration. As the concentration increases, the thickness of the films also increases. The crystal structure of the fabricated films was also determined using X-ray Diffraction (XRD) and Raman Spectroscopy. Both techniques revealed a cubic fluorite structure independent of the concentration of YSZ.

063 - Copper Recovery from an Industrial Metal Company Wastewater using Electrolysis

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Chemical Engineering Department, De La Salle University

Copper is one metal which is widely used in construction and electrical industries due to its properties, such as ductility, malleability and conductivity. Industrial metal companies involved in the manufacture of copper products generate large amounts of wastewater that usually contain high amounts of the precious metal. A specific metal company generates wastewater containing as much as 25-30% copper. Copper is recyclable. Recovering the precious metal from the wastewater for reuse will not only lead to treatment of the wastewater that is eventually discharged to the nearby surface water as well as generating savings to the company. This study aimed for the recovery of copper from an industrial wastewater using the method of electrolysis. Preliminary runs were first done to determine the anode materials, operation time and initial pH to be used in the actual experiments. Results showed good anode materials as stainless steel, lead and aluminum, a 2 hour-operation time and pH kept at the original value of the wastewater. In order to attain a high recovery rating, different variables affecting the process, were considered. Current density, stirring rate, electrode distance and anode material were varied at 30, 60 and 90 A/m²; 300, 500 and 700 rpm; 10, 20 and 30 mm; and, stainless steel, lead and aluminum, respectively. An L934 orthogonal array and the Taguchi method, a statistical technique that allows the main effects to be estimated with the least number of experimental runs, were used. Results showed low current efficiency ranging from 17.63% to 85.21% while the percent copper recovery was 80% and above for all actual runs. And with the main effect plot analysis, it was determined that the most influential parameter for current efficiency and copper recovery was current density and stirring rate respectively while the least influential for both was electrode distance. The best parameters for copper recovery were determined and found to be as follows: 90 A/m² current density, 700 rpm stirring rate, 30 mm electrode distance and aluminum anode. Finally, doing an experimental run using the best parameters, the recovery was 98.86%.

064 - Retrofitting of Fire-Damaged RC Columns with CFRP

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Deterioration of the structural performance of RC building usually happen when gutted by fire because of strength-loss of skeletal members especially the columns. One of the methods of recovering the strength (strengthening) of the deteriorated column is by the use of Carbon Fiber Reinforced Polymer (CFRP). This study focuses on the investigation of the compressive behavior of fire-damaged RC column retrofitted with CFRP wraps. A total of 21 square RC columns with cross-section of 150mm x 150mm and height 500mm were fabricated and tested to failure under compressive loading. Three classifications of columns were considered: control, fire-damaged, and CFRP-repaired RC columns. The control RC column specimens served as the reference to evaluate the strength decrease in fire-damaged RC column specimens which were exposed to 300°C fire for one and two hours. The strength restoration was done by employing partial and full wrapping repair technique. Based on experiment results, the use of CFRP full wrapping technique to repair fire-damaged RC column resulted to a higher strength restoration as compared to partial wrapping. However, it was also found out that a single ply is not enough to compensate the strength reduction due to fire damage. Based on the displacement and strain readings obtained, the confining stress produced by the CFRP was calculated. With this, an analytical model is proposed and presented to predict the confined compressive strength of the CFRP-repaired RC column based on the regression analysis of experimental results.

065 - The Reaction of Calcium Carbide with Cyclohexanone in the Presence of Potassium Hydroxide in Toluene, Hexanes, and Naphthalene-Hexanes Solvent Systems

Peter Immanuel dL. Tenido, Jose Carlo B. Avila, and Eric Camilo R. Punzalan

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The reaction of calcium carbide, CaC_2 , with two equivalents of cyclohexanone in the presence of potassium hydroxide, KOH, in toluene solvent produced the acetylenic diol, 1,1'-ethyne-1,2-diylidicyclohexanol in 6.1% yield, while the same reaction done in hexanes produced the acetylenic diol in 5.7% yield. Interestingly, the reaction in naphthalene-hexanes produced a crystalline product previously unreported in similar reactions. Mass and infrared spectra were used to identify the new crystalline product as 1-hydroxy-1,1':3',1''-ter(cyclohexan)-1''(3')-en-2'-one, a product formed by aldol condensations. Physical observations of the reactions as they proceeded may indicate that the reaction proceeds through the formation of a complex, evidenced by intense changes in color and solid formation upon the addition of cyclohexanone, although the nature, structure, and properties of the complexes were no longer studied. The study was based on the assumption that solvents capable of forming π -coordination bonds with cations facilitate the reaction, although present results cannot conclude as to whether this hypothesis is correct.

066 - LiveltUp! : An Ecofriendly Smart Fridge Plugin

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With the advent of climate change, the drive for conservation and renewable energy has been the main focus of both the industry and the research community. Intelligent systems have been aggressively being developed for most products to conserve consumption and improve efficiencies. Intelligent

systems already exist in almost all facets of life, from our cars, our offices and even our homes. Many researchers and industry giants have developed numerous systems for an intelligent home. Many of such systems are currently in use or being installed in new houses/offices. When intelligent home systems were being developed, many developers have given up on refrigerators because of its complexity; but with the advent of better hardware and software, developers are re-focusing again on the potential of such appliance. This research discusses the LiveltUp! System, an eco-friendly smart plugin developed to support refrigerators. It aims to remedy a number of problems with the use of mobile technology and embedded computer systems. Power consumption of the cooling system of these devices are highly inefficient, especially for older models. The research attempts to improve on the cooling system and its feedback control system by implementing an active type thermostat system and digital feedback control system. This is done by replacing the refrigerator's original thermistor with an LM35 Precision Centigrade Temperature Sensor and using a PIC18F4550 microcontroller and a relay to control the refrigerator's compressor motor. Inventory management is another issue for this type of device. Food spoilage is a common occurrence in any household because food tends to be forgotten until these have already passed their expiration date. The research addresses this concern by using optical sensor within the refrigerator's compartment to detect and identify objects entering and leaving the concerned space. Such information is stored in an online inventory system. The online inventory system provides users information on the quantity available and an item's expiration date. The online inventory system was made to be both accessible through either a computer's web browser or a special mobile phone application. Preliminary testing showed a minimum of 30% decrease in power consumption with almost similar cooling characteristics.

069 - Cyclic Voltammetric Study of PEDOT/Nafion Composite Film on Fluorine-Doped Tin Oxide (FTO) Glass

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Properties of conducting polymers can be enhanced by polymer chemical modification. Poly (3, 4-ethylenedioxythiophene) (PEDOT) is an excellent conducting polymer. However due to the inherent low solubility of the EDOT monomer and insolubility of PEDOT, the formation of a thin PEDOT film is a challenge. The use of Nafion as a charge balancing dopant allowed the facile electrodeposition of PEDOT:Nafion film on Fluorine-Doped Tin Oxide (FTO) glass surface. The electrochemical properties of the resulting PEDOT:Nafion composite film, characterized through cyclic voltammetry (CV), showed stable electrochemical performance after multiple cycles. Voltammetric study showed catalytic oxidation of $K_3[Fe(CN)_6]$ on PEDOT modified electrode. Moreover, the deposition of the polymer composite film enhanced the charge-transport of the FTO glass, confirming the effect of the ionomer dopant Nafion on PEDOT.

070 - Sniffer, Packet Classifier, Stateful Inspection, Rule Generation, Decision and Injector Modules of Stateful Network Intrusion Prevention System

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College of Computer Studies, De La Salle University

Network Intrusion Prevention System (NIPS) provides a way of detecting network anomalies through logging traffic and analyzing its content. Based on the result, it tries to block and prevent attacks that are detected from happening again. Still, traditional NIPS have a few shortcomings such as latency caused by the large set of rules and the lack of stateful inspection method. This paper focuses on the development of NIPS that can record packets that travels on the network to be used on its rule generation stage.

Specifically, this paper focuses on the tests done while maintaining a network connection with a NIPS deployed in the network. Tests were done while the NIPS captures and classifies ongoing packets in the network, then stores these data in a database and send these back. Tests were done in order to check if the system is capable in determining the state of each packet through stateful inspection. Latency test were done after the implementation of fuzzy logic to the decision module.

071 - A Video Collector and Repository System for the Empathic Space

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The Center for Empathic Human Computer Interaction at the De La Salle University focuses research on emotions and affect. A living space called the empathic space is a simulated living space inside the lab. This allows researchers to simulate living conditions and collect data from users. One type of data collected from the living space is the video data. To collect video data, the living space has several IP cameras and webcams installed strategically. The collected video can be analyzed or processed later for research. Because of the large amount of video data that can be collected and a need for automating the video collection, a software was developed that can record from a specific camera (whether it is an IP camera or webcam) and a repository for the video collection. This research details how the software and repository system was built, how the collection is being done and the performance of the system.

072 - Hydrogen Absorption into Graphite via the Zigzag Edge: A DFT-Based Study

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The reportedly high hydrogen uptake of carbon-based nanomaterials makes them attractive as hydrogen storage devices in fuel-cell-powered electric vehicles. DFT-based studies reveal that H₂ dissociative adsorption on the graphite zigzag (armchair) edge is non-activated (activated). Hydrogen is most likely to be found in its atomic form once inside the graphite layers. VAS effect for H₂ is very weak on both edges, but their differing H₂ scattering behaviours can identify unknown graphite edges. TDS measurements reveal recombinative molecular H₂ (D₂) desorption in a main peak around 445 K (490 K) and a minor peak at 560 K (580 K). Desorption activation energies for H (D) was determined as 0.6 eV (0.95) eV. Previously, we showed a reaction path exists for H absorption into graphite *via* the armchair edge. A strong H trap near the surface C atoms suggests that H termination of the edge C atoms' dangling bonds most likely occurs during absorption. Beyond the surface, absorption becomes more difficult without reconstruction. H stays near one of the graphite sheets during absorption. H motion parallel to a C row is possible while interlayer hopping is most unlikely to occur. The H barrier for desorption barrier between rows is always less than that the absorption's. Here, H absorption *via* the graphite zigzag is investigated. To elucidate the underlying mechanism, DFT-based total-energy calculations are performed with VASP using pseudo-potentials and plane-wave basis sets. Ion-electron interaction is described by US-PP/PAW method while GGA is utilized for the exchange correlation energy. The total energy is computed in a supercell geometry 4.92 Å wide to minimize H-H interactions. The graphite substrate with 56 C atoms is represented by periodically repeated slabs *ca.* 13.5 Å thick each and separated by 9 vacuum layers. During H absorption, the C edge atoms were pristine and no reconstruction occurred, with the shortest C-C distance at 1.42Å. Potential energies for various H lateral positions in a 3D mesh of points are determined to obtain the PES contour plots and surfaces corresponding to the current system.

073 - GPU-Enabled Lego Brick Approximation of Mesh Models

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College of Computer Studies, De La Salle University

Bautista (2007) developed an application that approximates a virtual Lego model based on an input 3D mesh model. The Lego model which is made up of Lego bricks is essentially an approximation of the mesh model. The quality of the approximation depends on the resolution. A higher resolution results into a more detailed Lego model. However, as the resolution increases, the approximation time also increases. This research is concerned with GPU enabled Lego brick approximation of mesh models. The research proponents implemented the approximation algorithm by harnessing the power of the GPU alongside the CPU. GPU programming using NVIDIA's CUDA allows faster execution than a CPU only solution. The tools utilized in the research were: CUDA Enabled Graphics Card, an NVCC compiler, and Microsoft Visual C++ 2008 Express Edition. These tools enable the use of GPU for general purpose computations. The machine specifications used to test the GPU+CPU and CPU-only versions were an i3 CPU 2.27 GHz and a NVIDIA GeForce GT 330M with 48 cores at 182 GFlops. Tests were performed on different mesh models (including the Bunny, Dragon models) on different levels of details. For higher levels of detail (i.e., higher resolution), the results showed that the GPU+CPU implementation achieved up to approximately 3 times speedup compared to the CPU-only implementation.

077 - Structural Model for Ag/AgCl Interface: A First-principles Study

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The Ag/AgCl electrode has long been used as a reference electrode for sensors because of its excellent electrochemical characteristics. Past studies have revealed the use of Ag/AgCl electrode in various applications like pH measurement, potential difference measurement in human bronchi, and other biopotential recordings. In more recent studies, these measurements recorded using Ag/AgCl electrodes have been shown being used in human-computer interfaces for communication, control and task classification. However, it was reported that the Ag/AgCl electrodes exhibit an important limitation concerning the internal solution and cannot fully comply with the characteristics required for electrodes hence the need for researches on new materials for the purpose. Previous studies where electronic and physical properties were determined and analyzed beforehand using computational methods suggest that such approach can be used to design electrodes for sensors. The approach has proven to be advantageous in the sense that designing materials require elaborate description of the mechanisms behind the performance of the device. In addition, cost-reduction and quicker results have been realized through such methods. Fundamental to the design of new electrodes using computational method is the investigation of the structure of the conventional Ag/AgCl electrode. So in this study, a structural model for silver/silver chloride interface have been developed through *ab-initio* calculations. These calculations were performed in the framework of plane-wave basis set combined with the density functional theory (DFT), as implemented into the Jacapo and the Vienna Ab-initio Simulation Package (VASP) computer codes. Using the local density approximation exchange-correlation functional, the equilibrium lattice parameters of bulk silver and bulk silver chloride were determined to be 4.13 Å and 5.59 Å, respectively. Both results are in good agreement with the experimental values. The surface lattice mismatch computations suggested that AgCl(111) grow on Ag(100), which was in agreement with experimental

observations. Finally, geometry optimization was conducted using VASP to determine relative energies of position stability necessary for the establishment of the structural model for Ag/AgCl interface.

079 - Preliminary Investigation on Dissociation of Water on Iron Surface (001)

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Reactions of iron and magnetite to water are cheap ways for hydrogen gas production that is needed for alternative source of energy. The cyclic transformation of iron to magnetite and magnetite to iron leads to the cyclic production of H₂ and water. In this study, density functional theory (DFT) investigation on hydrogen atom, oxygen atom and hydroxide on the surface on iron (001) are performed for the dissociation of water on iron using Vienna Ab Initio Simulation Package (VASP). Results showed that hydrogen and oxygen atom would tend to be in the hollow site of iron surface (001) while the hydroxide tends to be in the bridge site of the surface. This information tells us that dissociation of water to OH and H occurs near the bridge site. This is a preliminary study for oxygen storage for fuel cells and hydrogen gas production.

082 - Presenting and Contributing Locality-specific Road Traffic Information through Mobile Traffic Monitoring System

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As social networking sites such as Twitter became an effective accessory in delivering information, different entities such as companies and government agencies – in which Metro Manila Development Authority (MMDA) belongs to – utilize social networking sites and becomes a medium in delivering services to their clients. It then serves as a new channel for the followers – which could be a motorist or a commuter – to ask MMDA if roads of their concern are congested. Given this opportunity, the proponents seek to improve the existing system in a way that road traffic information such as incidents and traffic updates reach to the user and to provide alternate routes and responders in case of emergency. This paper presents the proponents' mobile traffic monitoring system prototype designed for MMDA and for the commuters and motorists in Metro Manila, Philippines. This system aims to provide support for MMDA in performing one of their primary services which is monitoring road traffic aside from planning, coordinating, and delivering other metro-wide services, while the non-MMDA users are provided with road traffic information presented in a rather organized fashion. The said objective was achieved by conducting interviews with MMDA personnel, followed by developing a prototype. The said prototype consists of server application that will collect road traffic-related reports, incidents, and queries from various contributors and then process into locality-specific traffic information which will later be presented to the users via the developed mobile application designed for Android mobile devices. A user acceptance test was conducted to 20 people to test its usability. The system performed most of the expected operations (i.e. retrieving traffic updates, accidents, list of emergency responders) but certain areas of the mobile application need improvement (i.e. responsiveness, stability of the application).

083 - A Peaceful Barangay 121 Zone 9 through GIS

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Barangay 121 Zone 9 is one of the 897 barangays in the City of Manila which is located in South Tondo a few kilometers from North Harbor and Divisoria. It is one of the largest and most populated barangay in Zone 9 with more than 5,000 residents as of 2007. This is a residential barangay with only few commercial establishments. One of the problems that the barangay needs to address is on the aspect of peace and order. There are a lot of reported cases of robbery hold-up, quarrellings among the neighborhoods, gambling, and drug addiction. These are recorded in the blotter book records of the barangay. Unfortunately, it requires a lot of effort to link these records with the population and other related factors due to the absence of a detailed barangay socio-economic and physical profile. Geographic Information System (GIS) is a specialized information system used to store, manage and manipulate geographically relevant data. GIS is a tool to link geographic features with other types of information such as tabular data, reports, pictures and video sequence. Hence, this research aims to integrate the peace and order records of the barangay with the socio-economic profile using GIS. Demographic information were gathered by student and community volunteers and stored in a spatial database. This was linked to a basemap generated using GIS. A web-based interface is being developed in order to facilitate the updating of peace and order information and socio-economic profile. It will also serve as the medium in presenting and visualizing information related to peace and order such as crime statistics, maps and reports. The GIS-derived information will greatly help the barangay officials in the upkeep of peace and order.

084 - Identification of Possible Livelihood Project in Barangay 121 Zone 9 through GIS

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Barangay 121 Zone 9 is one of the 897 barangays in the City of Manila which is located in South Tondo a few kilometers from North Harbor and Divisoria. It is one of the largest and most populated barangay in Zone 9 with more than 5,000 residents as of 2007. This is a residential barangay with very few commercial establishments. There are big numbers of the residents of this community are unemployed and most of the sources of income are small-scale self-owned business or job like sari-sari store, pedicab driving, carinderia, and house rentals. This research aims provide a tool for barangay planners and managers to view the overall demographic profile of the barangay. In this way, a holistic approach to address the unemployment problem will be provided. Geographic Information System (GIS) is a specialized information system used to store, manage and manipulate geographically relevant data. GIS is a tool to link geographic features with other types of information such as tabular data, reports, pictures and video sequence. A tool based on GIS will be designed to facilitate the storage of relevant data and presenting these data in visual form to the barangay planners and managers. Out of school youth, students and community volunteers will be involve in the data gathering process to highlight the sense of ownership for the system. A web-based interface is being developed in order to facilitate the updating of relevant information. It will also serve as the medium in presenting and visualizing information related to demographic profile such as statistics, maps and reports. The research output is a characterization of the economic status of the residents which will serve as guide to barangay decision-makers in the selection of suitable livelihood project for this community.

085 - Alleviation of Illiteracy Rate of the Youth of Barangay 121 Zone 9 through GIS

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Barangay 121 Zone 9 is one of the 897 barangays in the City of Manila which is located in South Tondo a few kilometers from North Harbor and Divisoria. It is one of the largest and most populated barangay in Zone 9 with more than 5,000 residents as of 2007. This is a residential barangay with very few commercial establishments. Despite the proximity of both the elementary and high schools in the barangay, there are still a lot of out of school youths residents. This is mainly due to poverty and proliferation of different vices. The barangay have a Day Care center for pre-school which can only cater 60 children in a year, and a recently launched community library, the barangay is still in need to come up a project that will address the education turmoil in the community. This research aims provide a tool for planners in ensuring that efficient and equitable distribution of resources is being implemented. Geographic Information System (GIS) is a specialized information system used to store, manage and manipulate geographically relevant data. GIS is a tool to link geographic features with other types of information such as tabular data, reports, pictures and video sequence. A tool based on GIS will be designed to facilitate the storage of relevant data and presenting these data in visual form to the barangay planners and managers. Out of school youth, students and community volunteers will be involve in the data gathering process to highlight the sense of ownership for the system. The research output would serve as basis for the design of the suitable literacy program for this community.

089 - Technology intervention simulations to improve industry productivity

Jose Edgar Mutuc

Industrial Engineering Department, De La Salle University

The basic goal of government in introducing interventions is to improve productivity of the entire industry rather than individual companies. The current model simulates the government efforts in improving individual companies with the intention of spreading successes to the rest of the industry members. The model incorporates government capacity for the improvement efforts and company operational issues. Conclusions and implications on the resulting interactions are made on the problems of government in improving productivity in industry.

090 - Robust Water Exchange Networks for Eco-Industrial Symbiosis

Kathleen B. Aviso

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The onset of climate change and the continued increase in population threaten to worsen the problem on water availability. The concept of water exchange between several industrial plants is a promising approach towards minimizing the consumption of water resources. However, establishing linkages between independently operating plants will be subject to uncertainties brought about by changes in operating conditions and the possibility of plant closure and the emergence of new participants. This research presents the development of an optimization model for identifying a robust network design in the presence of such uncertainties.

091 - Development of a Kit for the Semi-Quantitative Analysis of Urinary Calculi

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Chemistry Department, De La Salle University

The general components of kidney stones are relatively well known, but the actual composition of human urinary calculi differ from one person to another. The usual components are calcium oxalate, various calcium phosphates, uric acid, cystine and struvite. Determination of these components is necessary for physicians to prescribe the proper treatment and medication. Current diagnostic analysis of the compositions of kidney stones is expensive, time-consuming and quite inaccessible to the Filipino masses. Hence this study aims to devise an analytical method that identifies the compositions of kidney stones rapidly in a semi-quantitative manner without the involvement of expensive imported urinary calculi analysis kit or employing the use of sophisticated instruments. This method will greatly aid doctors in determining the composition of the patient's kidney stones and in immediately prescribing appropriate treatment and medication. This study is based on the work of Zeng and Jin, "Qualitative Analysis of Urinary Calculi". The selected analytical methods are semi-quantitative in nature and it allows for the calculation of the approximate chemical composition of calculi. A user's manual was made to accompany the kit produced and designed for use by medical practitioners and/or doctors. This study allowed for the semi-quantitative analysis of calcium and uric acid components of kidney stones and the qualitative procedures for the analysis of phosphate and oxalate were retained. To establish the concentrations of the test solutions in the publication of a user's manual, instrumental analyses were conducted alongside the colored reactions. To aid for the semi-quantitative analysis of calcium and uric acid, a simple Microsoft Excel program was made for easier calculation of these components. All instructions are included in the manual. The accuracy and effectiveness of the analytical methods of the study was illustrated by comparing the results of the seventeen urinary calculi samples with the control from National Kidney and Transplant Institute (NKTi). Percent match of the qualitative analytical methods for phosphate and oxalate with NKTi's analyses was calculated as 82.4% for both components. On the other hand, percent differences of the semi-quantitative analytical methods for uric acid and calcium with NKTi's analyses were also calculated. Percent differences for uric acid and calcium ranges from 2%-104.1% and 0.360%-92.2%, respectively.

092 - Synthesis and Characterization of C-Ag Composite Nanomaterials for Battery Electrode Application

Ruby Michelle N. Buot^{1,2} and Gil Nonato C. Santos²

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² **Solid State Physics Research Laboratory, De La Salle University**

Carbon-Silver composite nanomaterials were grown on the surface of a carbon rod using the Horizontal Vapor Phase Crystal Growth technique. The effect of flame annealing to the source materials before HVPC treatment and the varying ratio of the C-Ag materials were studied and was investigated using the SEM and EDX analysis. Results showed that after subjecting the annealed materials with flame, it produced a high yield of deposited nanomaterials compared to the unannealed ones. The improvement of the battery's characteristic was evident with the integration of the C-Ag nanomaterial composite and was confirmed through a comparative study of a 24 hour-voltage discharge profile against the other existing batteries and measurement of its internal resistance using dataStudio and PASCO V-I sensor.

093 - Dye Sensitized Solar Cells (DSSCs) with Photoelectrodes Synthesized via Horizontal Vapor Phase Crystal (HVPC) Growth Technique

Abel Ole and Gil Nonato Santos

Solid State Physics Research Laboratory, De La Salle University

Nanostructured TiO_2 was first synthesized on glass substrates at growth temperatures of 1000°C , 1100°C , and 1200°C with varying substrate distance from the bulk powder to determine the optimum substrate location in the fabrication of the photoelectrodes for DSSCs. Other parameters such as the amount of TiO_2 powder (99.99% P25 Degussa), dwell time, and ramp rate were kept constant at 35 mg, 6 h, and $10^\circ\text{C}/\text{min}$; respectively. In the fabrication of DSSCs, Fluorine-doped Tin Oxide (FTO) was used to deposit nanostructured TiO_2 for their photoelectrodes employing the optimum substrate distance identified by SEM analysis. Bixin dye extracted from *Annatto* was utilized as a low-cost sensitizer and a graphite coated FTO as counter-electrode. Three DSSCs with photoelectrodes fabricated at different growth temperatures had undergone electrical characterization under artificial light and actual sunlight. All the DSSCs with photoelectrode fabricated by HVPC growth technique achieved a relatively large open-circuit voltage (V_{oc}) of 387 mV, 427 mV, and 412 mV for growth temperature of 1000°C , 1100°C , and 1200°C ; respectively. Among the fabricated DSSCs with photoelectrodes grown at different temperatures, DSSC-1200 exhibited the largest short-circuit photocurrent (I_{sc}) of 45 μA compared to 40 μA for DSSC-1000 and 39 μA for DSSC-1100. As a consequence, DSSC-1200 demonstrated the largest recorded fill-factor of 0.24 and efficiency of 0.12 %. When the photoelectrode of a DSSC fabricated by solution based method was first subjected to HVPC growth technique, a very large enhancement in open-circuit voltage (V_{oc}) was achieved. The DL-DSSC-1200 resulted to the following cell parameters; $I_{sc} = 290 \mu\text{A}$, $V_{oc} = 488 \text{ mV}$, $I_{mp} = 119 \mu\text{A}$, $V_{mp} = 269 \text{ mV}$, $FF = 0.23$, and $\eta = 0.87 \%$ making it the best performing DSSC in the present study. Therefore, HVPC growth technique could be incorporated in the fabrication of photoelectrode for DSSCs either independently or in conjunction with the solution based approach.

094 - Synthesis and Characterization of Cadmium Selenide (CdSe) Quantum Dots using the Horizontal Vapor Phase Crystal (HVPC) Growth Technique for Sensing Copper Ion Concentrations

Arra Quitaneg and Gil Nonato C. Santos

Solid State Physics Research Laboratory, De La Salle University

Thirty five milligrams of CdSe powder with 99.99% purity was used in the synthesis. Scanning electron microscope (SEM) and Energy Dispersive X-ray (EDX) results showed the successful synthesis of nanospheres, nanoblades, nanoneedles, nanosheets, and quantum dots using HVPC technique. Applied spectral imaging was used for the photoluminescence characterization. The radii of the grown CdSe quantum dots were 2.19, 2.08, 2.04, and 1.91 nm, for 600°C , 4 hours, 600°C , 4 hours, 800°C , 4 hours and 1000°C , 6 hours growth conditions respectively. Energy gaps of the CdSe quantum dots synthesized using HVPC growth technique were 1.749, 2.065, 2.105, 2.125, and 2.185 eV. Quantum confinement effect was evident in the increase of energy gap and the blue shift of the emission wavelength peak as radius of quantum dot was decreased. SEM micrographs support the Stranski-Krastanov growth mode of self-assembled CdSe quantum dots. The synthesized CdSe quantum dots were shown to be effective in the optical sensing of concentrations containing copper ions. An increase in copper ion concentration resulted to a continuous quenching of the sample's fluorescence intensity. Fluorescence quenching mechanism in the study obeyed the Stern-Volmer behavior of fluorescence intensity decay.

095 - Synthesis, Characterization, and Evaluation of *In Vitro* Antimycobacterial Activity of Phthalimide Derivatives

Glenn V Alea and West Kristian D Paraiso

Chemistry Department, De La Salle University

New phthalimide derivatives with potential anti-tuberculosis activity were synthesized using the concept of molecular hybridization or combination of two pharmacophores in one drug. Seven phthalimides were prepared by condensation of phthalic anhydride with *p*-aminosalicylic acid, isoniazid and the sulfonamides sulfadimethoxine, sulfamethizole, sulfamethoxypyridazine, sulfanilamide, and sulfathiazole. The compounds were purified by recrystallization using hot ethanol and normal phase column chromatography using silica gel as stationary phase and ethyl acetate as mobile phase. The yields varied from 22.23% to 38.59%. IR spectroscopy was then used to characterize the compounds, with characteristic absorbances appearing, indicating the presence of the carbonyl group of the imide ring and the sulfonyl group. Spectral characterization using mass spectrometry, ^1H and ^{13}C NMR spectroscopy to completely prove the structures of the compounds are ongoing. The Antimycobacterial activity of the compounds against *Mycobacterium tuberculosis* H₃₇Rv will be evaluated to explore the possibility of using these phthalimides as anti-tuberculosis drugs.

096 - Geotechnical Properties of Road Base Materials in the Philippines

Jonathan R Dungca, Lydia Francisca T Dychangco and Julie Ann L. Jao

Civil Engineering Department, De La Salle University

Extensive road network plays an important role in integrating the island economies of an archipelago such as the Philippines. In line with this, large volumes of good quality embankment materials are required to support primarily its transport infrastructure. Department of Public Works and Highways (DPWH) sets material requirements of relevant engineering properties for aggregate base and sub-base courses. Herewith, two recommended gradations were investigated in order to determine whether or not significant differences exist between its properties. These gradations conform to the requirements of DPWH for aggregate base course and are referred to as "Grading A" and "Grading B". Laboratory tests were conducted in accordance with the ASTM standards to establish its specific gravities, Atterberg limits, maximum and minimum index densities, and California Bearing Ratios (CBR). The results showed that, as expected, the gradation which has a better distribution of grain sizes produces lower maximum and minimum void ratios for the reason that it contains just enough finer particles to pack around the larger particles and fill the voids in between them. In addition, it also produces higher CBR value due to the good interaction of coarse and fine particles allowing increase in the frictional and cohesive strength of the materials. Nevertheless, both resulting CBR exceeded the required value of 20 or higher for base courses. On the other hand, no considerable differences were seen on its specific gravities and plasticity indices since these are both mostly contributed by the physical and chemical characteristics of the material.

097 - A DFT-Based Study of Hydrogen Adsorption on Pd-Doped MgB₂ (0001) Surface

Paul M. Abanador, Melanie Y. David, and Nelson B. Arboleda

Physics Department, College of Science, De La Salle University

In order to address the main concerns of the hydrogen-based economy, materials for hydrogen fuel storage have been widely explored. In particular, LiBH₄/MgH₂ system with various catalysts has been considered because of its fully reversible hydrogen storage property. By utilizing density functional theory (DFT) calculations, the atomic hydrogen adsorption on Pd-doped MgB₂ (0001) surface is investigated in terms of total energies and structural properties. Firstly, results show that 11% Pd doping

of Mg surface sites in MgB_2 cause the lattice parameters a and c to reduce by 1.3% and 1.7%, respectively. Among the binding sites chosen for H atom adsorption, the hollow site far from Pd impurity is found to be the most favorable. Lastly, the corresponding binding energy for this site is stronger by 1.6 eV in Pd-doped MgB_2 as compared to that of pure MgB_2 . In general, a strong binding of H atom to the surface is expected to improve the kinetics of H_2 dissociation by lowering the activation barrier. These results can serve as an initial step in understanding the enhanced reversibility of hydrogen storage in Pd-doped $\text{LiBH}_4/\text{MgH}_2$ system.

098 - Glucosinolates in Alugbati (*Basella rubra*)

Darcy L. Garza, Nico Lorenzo M. Talento and Marissa G. Noel

Chemistry Department and CENSER, De La Salle University

Glucosinolates comprise a group of sulfur – containing glucosides which are known to exhibit biological activities with potential benefits to human health. In previous work it was found that the leaves of alugbati contain significantly high levels of glucosinolates, results that called for a more thorough investigation on these compounds in the plant. Four glucosinolates (GSL) were tentatively identified in alugbati. LC-MS analysis suggested the presence of sinigrin (allyl GSL), glucolepidiin (ethyl GSL), mercaptomethyl glucosinolate and a cinnamic glycoside glucocheirolin-6'-O-sinapoyl- β -D-thioglucoside. This is the first report on these compounds in the Basselaceae. A compound present in the red - stemmed alugbati variety was not detected in the green - stemmed type; otherwise, both varieties exhibited similar glucosinolate profiles and individual glucosinolates were found in roughly the same proportions. Alugbati samples grown under different planting regimes were analyzed to determine the effects of traditional, organic and innovative farming practices on the glucosinolate content. Results showed that in general, the biosynthesis of specific glucosinolates was relatively unaffected by the planting conditions. The only notable differences observed were the levels of the major compound, which could be glucocheirolin-6'-O-sinapoyl- β -D-thioglucoside, which significantly decreased with the application of fertilizer and/or pesticide. The optimum hydrolysis procedure for alugbati glucosinolates was determined. The addition of exogenous myrosinase and the cofactor ascorbic acid increased the yield of hydrolysis products. The dichloromethane extracts of hydrolysates consisted of several metabolites which were identified by GC-MS analysis to be possible degradation compounds of the glucosinolate hydrolysis products such as those coming from sinigrin and the cinnamic glycoside. Other compounds that have been reported to possess health promoting and allelopathic properties were also identified in the DCM extracts.

099 - Flavonoid Contents of Some Conventional and Unconventional Plant Samples

Ariel John D. Grona, Therese Marie S. Rosbero and Anamy Ma. C. Paano

Chemistry Department, De La Salle University

Flavonoids are important natural products known for their antioxidant, anti-inflammatory, anti-arthritis, anti-carcinogenic and antiallergenic activities. It is deemed important to explore alternative plant sources of high flavonoid content due to the tremendous demand for flavonoids in food, pharmaceuticals and in the cosmetic industry. Fresh plant samples of guyabano (leaves and peels), saluyot (leaves), dragon fruit (peels) and tea samples including Jasmine, *Camelia sinensis* and banaba green teas were used in this study. Each sample was defatted with hexane prior to acid catalyzed hydrolysis. Each hydrolyzed sample was partitioned with ethyl acetate to extract the less polar flavonoids then with butanol to extract the anthocyanins. The extracts were then subjected to analysis of total flavonoid using Dowd Method and to LC-MSⁿ analysis. The greater flavonoid contents of the ethyl acetate extracts compared to butanol extracts are expected however the dragon fruit peel showed

an opposite trend. The peel being colored is expected to have more anthocyanin-type flavonoids. The ethyl acetate extract of the tea samples showed very high total flavonoid content: the ethyl acetate extracts of Jasmine green tea (JGE) is comparable with that of Lipton (*Camelia sinensis*) green tea (LGE). That of banaba green tea (BGE) was significantly higher than the other tea samples. Among the fresh samples guyabano leaves showed the highest flavonoid content although it was not as high as the tea samples. Green tea processing such as fermentation may account for the elevated flavonoid content of green teas.

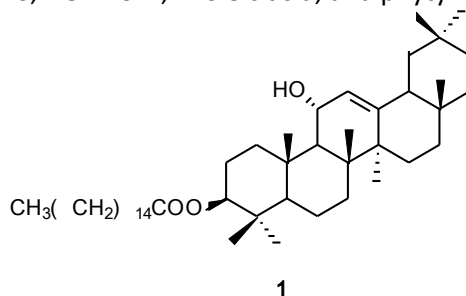
100 - A New Triterpene from *Barringtonia asiatica*

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The freeze-dried bark of *Barringtonia asiatica* afforded a new trieterpene, (3 β ,11 α)-11-hydroxyolean-12-en-3-yl palmitate (**1**). The bark also yielded mixtures of (3 β)-olean-12-en-3-yl palmitate, (3 β)-olean-18-en-3-yl palmitate and (3 β)-urs-12-en-3-yl palmitate in a 2:1:4 ratio; β -amyrin, α -amyrin and germanicol in a 3:1:4 ratio; 22-O-tigloylcamelliagenin A and betulinic acid in a 2:1 ratio; olean-12-en-3 β ,16 β ,22 α -triol, β -sitosterol, spinasterol, squalene and trilinolein. The roots yielded 2a-c, 3a-c and 4-6, while the flowers afforded 4-6, verimol k, linoleic acid, and phytol fatty acid ester¹.



¹Ragasa CY, Espineli DL, Shen C-C. (2011): A new triterpene from *Barringtonia asiatica*. *Natural Product Research*. DOI:10.1080/14786419.2011.619187

101 - Cytotoxic Triterpenes from *Barringtonia asiatica*

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Two new triterpenes from the leaves¹, a new triterpene from the bark² and the other chemical constituents (**1-11**) isolated from the dichloromethane extract of *Barringtonia asiatica*^{1,2} were tested for antimicrobial activity against seven microorganisms: *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis*, *Candida albicans*, *Trichophyton mentagrophytes* and *Aspergillus niger*. Results of the study indicated that germanicol cis-coumaroyl ester (**4**) and the mixture of β -amyrin (**8a**) and α -amyrin (**8b**) exhibited slight activity against *P. aeruginosa*. Compounds **1**, **2**, **4**, **5**, **6**, **7**, **8** and **11** are slightly active against *S. aureus*, while all the compounds tested exhibited slight activity against the fungus, *C. albicans*^{1,2}. All the compounds tested were inactive against *E. coli*, *B. subtilis*, *T. mentagrophytes* and *A. niger*. The constituents were also tested for cytotoxicity against a human cancer cell line colon carcinoma (HCT 116) by the MTT assay. The mixture of betulinic acid (**9b**) and 22-O-tigloylcamelliagenin A (**9a**) showed potent activity (IC₅₀= 7.9889) against this cell line, while germanicol (**5**) exhibited minimal activity (IC₅₀= 29.5575). The rest of the compounds tested were inactive against HCT 116. The two samples which gave positive results in HCT 116 were further tested for cytotoxicity

against non-small cell lung adenocarcinoma (A549). The mixture of **9a** and **9b** showed potent activity (IC₅₀ = 5.9963) against this cell line, while **5** exhibited minimal activity (IC₅₀ = 35.5972). The potent activity of the mixture may be attributed to betulinic acid (**9b**), a known anticancer compound³.

¹Ragasa CY, Espineli DL, Shen C-C. (2011): New triterpenes from *Barringtonia asiatica*. *Chemical & Pharmaceutical Bulletin*. 59(6): 778-782

²Ragasa CY, Espineli DL, Shen C-C. (2011): A new triterpene from *Barringtonia asiatica*. *Natural Product Research*. DOI:10.1080/14786419.2011.619187

³Ragasa CY, Espineli DL, Shen C-C. (in-press): New triterpenes from *Barringtonia asiatica*. *Chinese Journal of Natural Medicines*

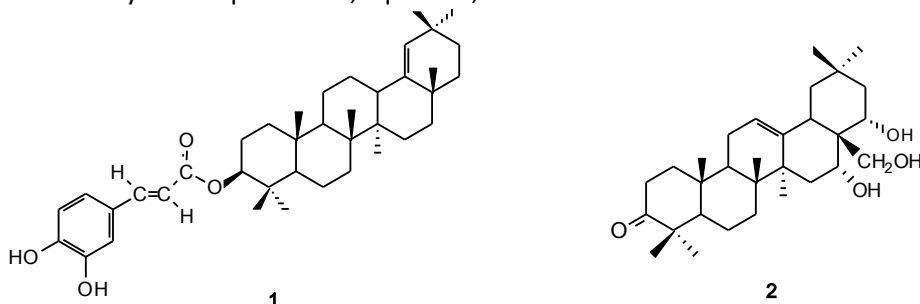
102 - New Triterpenes from *Barringtonia asiatica*

Consolacion Y. Ragasa¹, Dinah L. Espineli¹, and Chien-Chang Shen²

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The dichloromethane (DCM) extract of the air-dried leaves of *Barringtonia asiatica* afforded two new triterpenes, germanicol caffeoyl ester (**1**) and camelliagenone (**2**). Their structures were elucidated by extensive 1D- and 2D-NMR spectroscopy. The leaves also afforded germanicol trans-coumaroyl ester, germanicol cis-coumaroyl ester, germanicol, camelliagenin A, spinasterol, sitosterol, squalene, lutein and trilinolein. Germanicol trans-coumaroyl ester, spinasterol and trilinolein were isolated from the fruits, while the seeds yielded spinasterol, squalene, linoleic acid and trilinolein¹.



¹Ragasa CY, Espineli DL, Shen C-C. (2011): New triterpenes from *Barringtonia asiatica*. *Chemical & Pharmaceutical Bulletin*. 59(6): 778-782

103 - New, Cytotoxic and Antimicrobial Compounds from *Cinnamomum cebuense* Kosterm. (Lauraceae)

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Cinnamomum cebuense, an endemic and critically endangered tree found only in Cebu, Philippines afforded a new monoterpene natural product (**1**) and a new sesquiterpene (**2**), along with the known compounds, 4-hydroxy-3-methoxy cinnamaldehyde, 4-allyl-2-methoxyphenol, α -terpineol and humulene¹. The DCM extract of the leaves of *C. cebuense* yielded humulene, β -caryophyllene, squalene, and a mixture of α -amyrin, β -amyrin and bauerenol¹. Their structures were elucidated by extensive 1D and 2D NMR spectroscopy and by comparison of their ¹³C NMR data with those reported in the literature. Five compounds isolated from the dichloromethane extract of *Cinnamomum cebuense*: α -terpineol (**1**), 4-allyl-2-methoxyphenol or eugenol (**2**), humulene (**3**), 4-hydroxy-3-

methoxycinnamaldehyde (**4**) and a monoterpene (**5**) were evaluated for cytotoxicity against a human cancer cell line, colon carcinoma (HCT 116) using the MTT cytotoxicity assay. Compound **4** showed moderate cytotoxicity against this cell line with an IC_{50} value of 18.8004 $\mu\text{g/ml}$, while **3** and **5** exhibited slight cytotoxicity. Compounds **3-5** were further tested for cytotoxicity against the non-small cell lung adenocarcinoma (A549) and the non-cancer cell line Chinese hamster ovary cells (AA8). Sesquiterpene **3** exhibited moderate cytotoxicity against A549 with an IC_{50} value of 23.1964 $\mu\text{g/ml}$, **4** indicated slight cytotoxicity, while **5** was non-toxic against this cell line. Compound **4** showed moderate cytotoxicity against AA8 with an IC_{50} value of 20.4837 $\mu\text{g/ml}$, while **3** and **5** exhibited slight cytotoxicity. Compounds **1, 2** and **3** were active against bacteria: *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Bacillus subtilis* and fungi: *Candida albicans* and *Trichophyton mentagrophytes* and were found inactive against *Aspergillus niger*. Sesquiterpene **3** was the most active against *E. coli*, *P. aeruginosa*, *S. aureus*, *C. albicans* and *T. mentagrophytes*, while **1** exhibited the highest activity against *B. subtilis*, even surpassing the activity of the standard antibiotic Chloramphenicol.

¹Ragasa CY, Espineli DL, Agoo EMG, del Fierro RS, Don M-J, Shen C-C. (in-press). *Chinese Journal of Natural Medicines*.

104 - Redox Properties of Glucose-containing Tetrathiafulvalene (TTF) Derivatives

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The redox properties of a series of glucose substituted tetrathiafulvalene (TTF) derivatives prepared to overcome the low solubility of TTF in hydroxylated solvents were measured using cyclic voltammetry. Glucose generally lowered the two-step oxidation potentials of TTF with the effect more pronounced when sulfur is bonded to C6 than C1.

105 - Modeling Self-Rated Poverty in the Philippines Using Joinpoint Regression Analysis

Juan Antonio A. Tabalba, Randy R. Santos, and Rechel G. Arcilla

Mathematics Department, De La Salle University

Poverty is evident in the Philippines and most people claim that poverty incidence is gradually increasing over the years. However, the government claims otherwise because of effective intervention programs that have been implemented. In order to check the validity of this claim, a joinpoint regression analysis was performed to model self-rated poverty (SRP) in the Philippines. Comparison of the Mean Square Errors (MSEs) of three heteroscedastic options showed that the lowest MSE was obtained when Poisson model using count was used in fitting the SRP model. Permutation test performed to determine the number of joinpoints resulted to the selection of the 1-Joinpoint model. Results showed that there was a significant decline of 0.93% on the SRP during the 14th period (Cory Aquino's administration). Also, SRP started to decrease from 1992 until present. This implies the possible effectiveness of intervention programs implemented by the government in decreasing SRP in the Philippines.

106 - Carbon Nanotubes Doped With Nitrogen, Pyridine-Like Nitrogen Defects, and Transition Metal Atoms

Michael Mananghaya^{1,2}, Emmanuel Rodulfo¹ and Gil Nonato Santos¹

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Dopants and defects can be introduced as well as the intercalation of metals into single wall carbon nanotubes (SWCNTs) to modify their electronic and magnetic properties, thus significantly widening their application areas. Through spinpolarized density functional theory (DFT) calculations, we have systemically studied the following: (i) (10,0) and (5,5) SWCNT doped with nitrogen (CN_xNT), (ii) (10,0) and (5,5) SWCNT with pyridine-like defects (3NV-CN_xNT), and (iii) chemical functionalization of (10,0) and (5,5) 3NV-CN_xNT with 12 different transition metals (TMs) (Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Pd, and Pt). Attention was done in searching for the most stable configurations, deformation, calculating the formation energies, and exploring the effects of the doping concentration of nitrogen and pyridine-like nitrogenated defects on the electronic properties of the nanotubes. Also, calculating the corresponding binding energies and effects of chemical functionalization of TMs on the electronic and magnetic properties of the nanotubes has been made. We found out that the electronic properties of SWCNT can be effectively modified in various ways, which are strongly dependent not only on the concentration of the adsorbed nitrogen but also to the configuration of the adsorbed nitrogen impurities, the pyridine-like nitrogenated defects, and the TMs absorbed; due to the strong interaction between the d orbitals of TMs and the p orbitals of N atoms, the binding strengths of TMs with the two 3NV-CN_xNT are significantly enhanced when compared to the pure SWCNTs.

107 - An Analytical Model to Determine the Viability of Urban Agricultural Systems

Robert W. Taylor and Jose Santos R. Carandang VI

Biology Department, College of Science, De La Salle University

With world population at seven billion and with food prices increasing, policy-makers are searching for new approaches to solve the emerging challenge of global food security. Increased demand for food as a result of global affluence combined with population growth, and supply shortages due to adverse weather-related events closely associated with global climate change, have directed attention at utilizing urban areas as potential locations for increased agricultural production. Cities have been traditionally defined as places where industrial and commercial activity is centered, not places associated with agricultural production. But in the move to advocate sustainability, cities are being redesigned as autotrophic eco-systems. One of the main determinants of sustainable urban design is to place greater emphasis on producing and consuming food in place. This movement entails greater emphasis on utilizing cities as self-supporting systems whereby energy, materials, and food are produced and consumed regionally, thereby reducing their ecological footprint. This model often conflicts with traditional approaches that emphasize comparative advantage. This research paper establishes an analytical model whereby two major urban agglomerations, Metro Manila, Philippines and New York-New Jersey Metro Area, one in a developing country and the other in a developed country, are measured for their potential at delivering an urban agricultural system that is both sustainable and cost-effective. The model tests whether urban agricultural systems are viable based on these two dimensions, sustainability and cost-effectiveness. The sustainability dimension accesses viability through an economic analysis whereby externalities, i.e. carbon footprint, water use, land use, pollution, and resource use, are internalized in the decision model. The cost-effectiveness dimension is based on criteria exclusively determined by costs used in traditional decision models, i.e. costs related to land, transportation, labor, capital, etc. And lastly, the analytical model addresses the question of

whether urban agricultural systems might have greater applicability in cities in developing economies rather than in developed economies as a way to meet the challenge of food security.

108 - A Survey on C2C Online Buy and Sell Websites in the Philippines

Kenneth Pera, Kathlynn Siao, Neal Yu, and Willy F. Zalatar

Department of Industrial Engineering, De La Salle University

Millions of Internet users worldwide are engaged in buying and selling of different products using C2C online buy and sell websites. In the Philippines, there are many C2C online buy and sell websites which offer a variety of products from cars to computers. The aim of this paper is to determine the important attributes that buyers look for in evaluating website performance. A survey was conducted with customers of three different online buy and sell websites in the Philippines as respondents. Results show that website content, website format, ease of use, variety of items, safety, and buyer-seller communication are positively related to website performance.

109 - Design and Characterization of a 0.5-um All MOS Op-Amp-less Bandgap Voltage Reference

Alexander C. Abad and Donato A. David

Electronics and Communications Engineering Department, De La Salle University

Voltage reference is vital in any precision circuits such as data converters. It must be stable with respect to changes in supply voltage, temperature and process variations. This paper focuses on the design and characterization of an All MOS Op-amp-less Bandgap Voltage Reference circuit using 0.5um CMOS technology. The circuit has a voltage reference of 558.11 mV at 27°C using its typical supply voltage of 5V. It has a temperature coefficient of 29 ppm/°C from 0°C to 100°C, and a line regulation of 6.03 mV/V from 2V to 7V voltage supply. The circuit is tested at five process corners (TT, SS, FS, SF and FF) and simulated using TANNER software.

111 - Regression-Based Estimation Methods of Barangay Level Poverty Incidences Using CBMS Marinduque Data

Shirlee Ocampo, Amerigo Lorenzo de la Paz, and Glorianne Mariz Valera

Mathematics Department, College of Science, De La Salle University

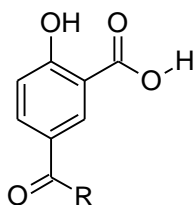
The research study obtained barangay level poverty incidence estimates through regression-based methods such as multiple linear, Poisson and negative binomial using 2008 Community-Based Monitory System (CBMS) Marinduque data. Under the multiple linear regression analysis, arcsine square root transformation of barangay level poverty incidences was used. Principal component analysis was applied to minimize multicollinearity for Poisson and negative binomial regression analyses. Goodness of fit test showed that the Poisson regression model is overdispersed. Negative binomial model ($p = 1$) is preferred over negative binomial model ($p = 2$) based on smaller Akaike information criterion (AIC) and Schwarz Bayesian information criterion (SBC). Results showed that among these regression-based estimation methods, multiple linear regression model (MLRM) yielded the closest estimates with the actual poverty incidences. Significant correlates under MLRM include households with no access to sanitary toilet, experienced food shortage, own electric fan, computer, cell phone, car, engaged in fishing, forestry, mining and construction.

112 - Synthesis of Pyrazinamide Analogs of Aspirin

Glenn V. Alea, Faith Marie G. Laguna, and Michael Dominic M. Ajero

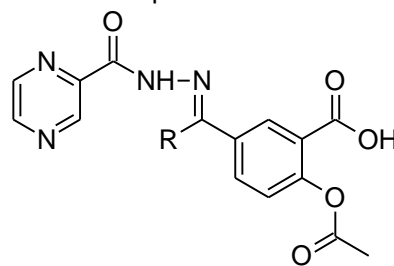
Chemistry Department, College of Science, De La Salle University

Pyrazinamide derivatives of aspirin (**3**) and (**4**) were synthesized. The synthesis involved the Friedel Crafts acylation of methyl salicylate using the appropriate alkanoyl chloride and $ZnCl_2$ as catalyst followed by hydrolysis to produce the precursor compounds (**1**) and (**2**). Compound (**1**) was coupled with the pyrazinamide moiety via imine formation followed by acetylation to produce compound (**3**) in 41.10% yield. Compound (**4**) was generated in 8.207% yield from the coupling of acetylated compound (**2**) and 2-pyrazinehydrazide. These compounds may exhibit improved activity against pyrazinamide resistant and susceptible strains of *Mycobacterium tuberculosis*. A recent study has shown that the activity of pyrazinamide is enhanced if administered together with aspirin.



1 R = $-(CH_2)_6CH_3$

2 R = $-(CH_2)_2CH_3$



3 R = $-(CH_2)_6CH_3$

4 R = $-(CH_2)_2CH_3$

115 - Identifying the Gap: Challenges and Solution to Community Enabled Disaster Management in the Philippines

Christian D. Echavez

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The efficacy of disaster management efforts in the Philippines is severely hindered by financial and resource constraints, a characteristic common to developing countries. The current disaster management approach implemented in the Philippines heavily relies on local and national government, both of which are dependent on cooperating with non-governmental organizations and assistance coming in the form of foreign aid to address disasters. Typhoon Ketsana (local designation Typhoon Ondoy) served as a tipping point for the country highlighting the flaws of the approach and cemented the need for disaster-response force multipliers. These flaws put the community in a minor role leaving it vulnerable to disasters. The community has the untapped potential to act as the critical disaster-response force multiplier. The end goal is the formulation of an appropriate model for disaster management in the Philippines that will augment disaster management efforts by empowering the community in contributing to disaster management efforts through the use of enabling technologies. However to arrive at such a goal there are several issues that need to be addressed. The primary objective of this paper is to identify and assess how communities can augment the current approach and practices in disaster management alongside local government units. A secondary objective is to identify potential enabling technologies that can address the challenges in implementing such an approach. And the third objective is to establish a base line that can serve as a metric for current and future systems. The methodology used was a template-driven processing design methodology for crisis management information systems proposed by Lee J. and Bui T. (Jan 2000) and a canonical action research approach

done with in partnership with the Muntinlupa Disaster Risk Reduction and Management Council (Urban) and the local government of Bagac, Bataan (Rural). The result is the generation of deductive and normative templates that contribute to community and local disaster management capability and as base line metric for assessing disaster management systems. The paper concludes that the development of Disaster-Management-Information-Systems based on Geo-Spatial Technologies and adoption of the Crowd-Sourcing paradigm allows for the improvement of community-based disaster management.

116 - On Generalized Bell Polynomials

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Bell numbers are best known as the sum of Stirling numbers of the second kind. These numbers have applications in Statistics in connection to the Poisson distribution. To extend the applicability of Bell numbers, generalizations of these numbers have become the focus of study of many mathematicians. One of these generalizations is the *generalized Bell polynomial* defined by L.C.Hsu and Peter Shuie in 1998, as the sum of the unified generalization of Stirling numbers. Results obtained by Hsu and Shuie are limited due to the level of difficulty in handling their generalization. In the present paper, further investigation is done of the generalized Bell polynomial of Hsu and Shuie and we answer the problem: What generalization of Bell numbers will preserve almost all of the properties of ordinary Bell numbers? The research is carried out with the following objectives:

1. To establish a recurrence relation of the generalized Bell polynomial;
2. To show the concavity of generalized Bell polynomial;
3. To define a variation of the generalized Bell polynomial and obtain a combinatorial interpretation;
4. To define the (r,β) -Bell polynomial and obtain formulas such as the generating function expressed in terms of hypergeometric function, an integral representation, an expression in terms of the moment of the Poisson random variable and an asymptotic approximation for the (r,β) -Bell numbers.

The method used in attaining objectives 1 to 3 is purely on enumerative combinatorial mathematics, while the method used in attaining objective 4 is on analytic combinatorial mathematics. The results of the study include the following: (1) It is shown that the sequence of generalized Bell polynomials $S_n(x)$ is convex under some restrictions of the parameters involved; (2) A kind of recurrence relation for $S_n(x)$ is obtained and some numbers related to generalized Bell numbers are identified; (3) Theorems on (r,β) -Bell polynomials are established and; (4) An asymptotic approximation of the (r,β) -Bell numbers is derived. From the results of the study, we conclude that the generalization of Bell numbers in terms of the (r,β) -Bell polynomial preserve almost all the properties of ordinary Bell numbers.

118 - Development and Test of a Vision-based Road-lane Detection System for Robotic-Car Application

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This study is part of a research effort to develop a self-driving car or robotic car. The main objective was to develop and test robust digital image processing methods to isolate and track actual road lane markings from digital video images taken from a camera mounted on a car. A typical computer webcam

type CCD camera was used for the study mounted on top of a car to acquire digital video images of the up to 18 meters of the road ahead at a maximum speed of 40 kph. Acquired video was subjected to cropping, segmentation and various filtering methods to detect the lane marks on the road. Detected lane marks were validated based on linear and second degree polynomial models of the road lanes. Test results showed that when road lanes were clear (no breaks) detection was 100%. However, broken road markings and noise from pedestrian lanes, shadows etc. can lower detection accuracy to below 70%. While the developed algorithms was successful in detecting and tracking clear road lane marks, additional research is still needed for more robust lane detection performance particularly under noisy conditions.

119 - DOST-SMART Department of Science and Technology-System for Managing Training
Marivic S. Tangkeko, Nerissa Hannah A. Adriano, Kimberly Jane L. Go, Rochelle Vanessa S. Pua Phee
and Ephraim Tiakseng U. See

Information Technology Department, College of Computer Studies, De La Salle University

An organization's success relies on the ability of its human resources to function effectively and efficiently. One way of doing this is to ensure that the manpower continually hone their knowledge and skills through training and development. Thus, managing the human resources development is therefore vital in the operations of any organization. With the advancement in Information and Communications Technology (ICT), an institution can perform this function through the use a Training Management System (TMS). For a developing country like the Philippines, small and medium enterprises (SMEs) cannot afford to allocate operating budget for the training of their manpower. The Department of Science and Technology (DOST) is one of the government agencies that assists SMEs in improving their human resources by conducting free skill-based short courses/training. For DOST to provide the right topics to the right people, they need to assess the current knowledge and skills of the individual who will need the training. Knowledge and skills assessment (KSA) models can gauge these training requirements. This paper will present a Training Management System specifically designed to assist DOST in providing the necessary training topics for SMEs. The developed TMS incorporated a knowledge and skill assessment (KSA) model, which recommends the necessary training needs for specific individual knowledge and skill set. The developed prototype was validated through a user's acceptance testing ((UAT) by key personnel of DOST and a few trainees. The prototype was refined using the results from the UAT. DOST is very much willing to have the said system implemented in the near future.

120 - Generic University Information System – Empowering the State Universities and Colleges

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The recent developments in Information and Communications Technology (ICT), has made computers progressively smaller, more affordable, and more powerful that are even capable of storing an almost limitless amount of data and information, which can be linked together through database management systems (DBMS). With these revolutionary changes, ICT is becoming more prevalent in many industries such as its application and integration in various educational sectors. Nowadays, schools are integrating student information systems (SIS) in handling students' records, keeping track of applications and documents as well as synthesizing important related information found in different departments efficiently and effectively. SIS empowers not just administrators and staff but also students and professors by enabling them to access information related to their everyday school life. This paper will present the design and development of a generic university information system. The study methodology

used was to conduct a study on 3 local universities with regards to their operation, made a comparative analysis through benchmarking and eventually design the generic system. Then a user's acceptance testing (UAT) was conducted on the developed prototype in order to validate the features and modules of the Generic University Information System (GUIS). Summary of the result of the UAT is also presented in this paper. The GUIS serves as the back-end for the mobile platform, iUniversity, developed in 2010.

121- Hypoglycemic Potential of Triterpenes from *Alstonia scholaris*

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The dichloromethane extract of the air-dried leaves of *Alstonia scholaris* (L.) R. Br. afforded a mixture of cycloeucalenol (**1a**), cycloartanol (**1b**) and lupeol (**1c**); lupeol acetate (**2**); and betulin (**3**). The structures of these triterpenes were elucidated by extensive 1D and 2D NMR spectroscopy and confirmed by comparison of their ¹³C NMR data with those reported in the literature. A possible hypoglycemic property was observed for a mixture of **1a-1c** at a dose of 25 mg/kg BW administered orally to normoglycemic mice.

122 - Fabrication and Characterization of Ppy-NaTS Thin Films Using the Printing-Direct Patterning Technique

Maria Carla Manzano and Enrique Manzano

Physics Department, De La Salle University

Traditionally, conducting polymers are created by electrochemical deposition (using an electrochemical cell and a either a galvanostat or two or three-electrode potentiostat) or employing a spincoater. These methods tend to be slow, inaccurate and very wasteful of precious chemicals. This paper investigates a third fabrication method of Ppy-NaTS thin films using a commercial-grade inkjet printer by patterning directly the thin film on a substrate. This is a first look investigation by DLSU Solid State Physics Lab on the effect of type of solvent, printing parameters, substrate or surface on the dewetting of the polymer from the hydrophobic patterned lines. The developed conducting polymer is then characterized and compared from those developed by the lab using the electrochemical deposition.

123 - Electric Tricycle Modeling, Design Optimization and Performance Projections

J.B. Manuel M. Biona, Precious Alvarez and Archie Maglaya

Mechanical Engineering Department, De La Salle University

Tricycles are mostly powered by two stroke engines making it a major source of air pollution in the country. A number of alternative technology solutions have been introduced including electric vehicle technologies. The study is part of efforts to assess and improve the current designs of electric tricycles. A computer model has been developed to evaluate its performance under various component combinations based on actual tricycle drive cycles. Results closely fitted with on-ground data generated by the ADB project in Mandaluyong City. The model was utilized to determine component combination that will provide optimum economic attractiveness while ensuring performance acceptability. The model was also utilized to project attainable performance in the next five years. Results indicated that the shift to lithium Iron Phosphate batteries could increase system efficiency from 8.1 km/kWh to 16.3 km/kWh while the integration of a regenerative braking capability could further increase by an

additional 3.8 km/kWh. Improvements in body and drive train design on the other hand may be expected to eventually increase efficiency to 26.9 km/kWh.

124 - Life Cycle Assessment of *Jatropha curcas* L. to Biodiesel: Preliminary Results

Jeremias A. Gonzaga, Jose Bienvenido Manuel Biona, Archie B. Maglaya

Mechanical Engineering Department, De La Salle University

Jatropha curcas has gained much research interest in the society, since it is a promising potential source for biofuels due to its apparent low cost as feedstock. Thus looking to its potential, it will allow good opportunities to local communities in generating their own conveniently used fuels for electricity, transport or cooking, significantly avoiding expenses in obtaining fossil fuels externally. A serious consideration must be given to the following aspects: national policies on biofuels, organizational and social aspects in large scale plantations, biodiversity and its environmental issues. *Jatropha curcas* is a non traditional feedstock for biodiesel production in the Philippines. It is reported that around 2.9 kg of *Jatropha* seeds can produced 1 liter of crude oil. A preliminary result of the Life Cycle Assessment of *Jatropha* to Biodiesel System covers fundamental processes involved in production in order to evaluate environmental impacts associated in different stages of the process. A functional unit of this study is 1 liter of biodiesel production from *Jatropha* oil seed. In this paper, streamline LCA observation in *Jatropha* and the impact of different factors on crop performance and exchange on knowledge and information, in order to prevent unjustified investment are presented. These technical aspects being considered bare significant impact on the socio-economic effects to large scale plantations particularly in labor cost and its reliance. The results showed fertilization processes consume significant amount of energy that needs to be reduce, further analysis is currently being conducted.

126 - AGILA: Disaster Management Decision Support System

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AGILA is a Decision Support System (DSS) for disaster management for the city of Muntinlupa. It is focused on the preparedness phase in disaster management and it is dedicated to disasters caused by typhoons and flooding. AGILA is also a crowdsourcing system that utilizes the role of the Internet in everyday living and the potential of the latest tools in online mapping technologies. AGILA not only assists key stakeholders but it also empowers the community to play a key role in the planning and preparation. Damage assessments on typhoons for the last couple of years in Muntinlupa City indicate that clearly there is lack in resources. Furthermore, reports also show that a significant amount of these valuable resources did not go to the most qualified areas when considering historical data and population statistics. The overall process in the preparedness phase experiences various difficulties in handling information such as gathering data thru informal text messages¹ and unformatted forms, and the lack of a systematic means of exchanging information among task forces. In addition, the absence of a single repository of data or a database proves to be another missing key component. With a lot of information to be gathered, stored and processed, the pen-and-paper method simply cannot consolidate and take into account every single piece of information to maximize the assets and to minimize the damages of typhoons. The main objective of the system is to aid the Muntinlupa City Disaster Risk Reduction Management Office (MCDRRMO) analyze the preparedness of its city by providing decision makers with relevant, accurate and up-to-date information that is crucial to come up

with the most plausible decisions for resource allocation and manpower mobilization. AGILA has been developed step by step with the MCDRRMO to ensure that their processes have been incorporated within the system along with the effective integration of activities among the task forces and more importantly, the community. The responsibility of effective disaster management no longer lies within the walls of local government offices; it takes the cooperation and participation of the whole community.

127 - Managing Typhoon Disaster Prevention and Preparedness through Agent-Based Simulation

Antonio Louis A. Holmes and Dennis T. Beng Hui
Industrial Engineering Department, De La Salle University

The Philippines experiences around 20 typhoons per year, comprising 75% of total natural disasters recorded locally since 1990. These typhoons have been costly, destructive and deadly as thousands of barangays are affected and damages worth billions of pesos have been incurred. Given limited resources and access to information, disaster management and response programs of both public and private agencies and organizations failed to address the precarious situation confronted by many Filipinos. This study aims to address this deficiency by incorporating the behavior of the independent decision makers with regard to disaster management. In doing so, the study hopes to provide a deeper understanding of their functions and objectives and highlight possible points of coordination among decision makers. The Agent-Based Simulation methodology is adapted to focus on the individual decision making by different entities over a period of time- to be able to integrate scenarios with policy-making and to provide an accurate representation of the feedback shared among everyone involved in the system. As a means of measuring the effectiveness of programs, evacuation and relief operations were identified as a focal point of the study. The model is ran under several setups, to ensure that it is able to replicate the behavior of agents during the actual occurrences of disasters. The simulation runs showed the importance of data accessibility in convincing the affected population to evacuate, as their multi-commodity needs (food, clothing and medicine) would need to be satisfied. It was also seen that ineffective management due to internal conflict has impeded this process, probably as a result of competition for recognition. This underscores the need for a coordinating unit formed to study the operational strategies among agencies and how they could work together in achieving disaster preparedness and prevention.

129 - Wigner Function for the Deformation Quantization of the Two-Dimensional Harmonic Oscillator

Ermys B. Bornilla
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The Wigner function for the two-dimensional harmonic oscillator is derived, since this is the starting point for the deformation quantization scheme for such a system. The resulting function involves Laguerre polynomials as contrasted with conventional quantization where the wave function contains Hermite polynomials. The energy eigenvalues are obtained using only real phase space functions, without explicitly involving operators.

130 - A Coral Reef Monitoring and Mapping System for Western Luzon Seas

Anton Barba, John Ravago, Charles Stephen Vicencio, and Ma. Victoria Pineda

Information Technology Department, De La Salle University

Coral reefs occupy less than a percent of the ocean floor, however, it is considered to be the most biologically diverse ecosystem where 25% of all marine species are living (Washington, 2006). At present there is a continuous global coral bleaching event happening due to El Niño and it was recorded that over 16% of world's coral reefs have been severely damaged where 20% of those destroyed shows no signs of recovery (Wilkinson, 2004). This global activity is due to the gradual increase of temperature brought by the El Niño an effect brought on by "climate change". Bleaching is the whitening of coral reefs due to the changing of sea temperature. In response to the bleaching, different countries from all around the world try to monitor coral bleaching and help these corals recover from the bleaching (Wilkinson, 2003). Monitoring of coral reefs must be done on a regular basis and on a specified period of time. This entails gathering data and information about the ecosystem of the corals. Through the use of ICT, open source development tools, careful process analysis of the coral reef bleach and status reporting and rapid prototyping, proponents of this project developed a web-based application to support the said activities. The research project is also intended to support the major tasks of Reef Check Philippines, a dedicated NGO formed to keep the coral reefs healthy by monitoring the its conditions. The research project covered the areas of Bataan, Batangas and Mindoro. The system supports the translation of the Reef Check divers' sightings to meaningful, understandable graphical reports; enhances the process through mapping, incident reporting and comparison of multiple reports over time. It assists in analyzing the situation by using graphs that can be interpreted easily at first glance. The graphs are designed for Reef Check's presentation to the government, LGUs and other interested party so that these organizations can easily interpret what is happening to the coral reefs and have an estimation of damage if it is happening. The lead scientist and some divers of Reef Check Philippines evaluated the system to have great potential for deployment.

132 - Community Profiling and Mapping for CREST

Justine Christian Aguas, Steffi Marie Caunga, Jennifer Ebor, Antonio Bowie Villaseñor, and Ma.

Victoria Pineda

Information Technology Dept, De La Salle University

Disaster was defined by the handbook of Community-Based Disaster Risk Management as a serious disruption of the functioning of the society, causing widespread human, material or environmental losses, which exceed the ability of the affected communities to cope using their own resource. Disaster occurs when the negative effects of the hazard are not well managed. Since 1995, according to Centre for Research on the Epidemiology of Disasters (CRED), there is a huge increase in both frequency and impact of disasters especially typhoons and cyclones. It is notable that developing countries like the Philippines have the highest cases of disaster fatalities. This is because of the fact that most people from developing countries are poor thus making them more vulnerable to the impact of disasters. Vulnerability is an unsafe condition that can be physical, economic, social, behavioral and environmental (Anderson and Woodrow, 1989). With this said, different disaster organizations found in developing countries are practicing Community-Based Disaster Risk Management (CBDRM). This is a process that communities at risk actively engage in to for identification, analysis, treatment, monitoring and evaluation of disaster risks for them to be able to reduce their risk in disaster and improve their capacities (Yodmani, 2006). This only means that the people in the community are the ones actively involved in decision making and in the implementation of disaster risk management activities. Through the use of ICT, the proponents of the project cautiously analyzed the process of CBDRM done by a NGO

called Community Response for Enlightenment, Service and Transformation (CREST). With this, the proponents developed a web-based application to support it. Presently, the project covers the area of Baseco and Parola communities. The system aids in processing and visualizing the data gathered from the operations of CREST by showing it through graphs and maps thus making it more understandable and usable. The users would easily know the current state of different communities. With this, the system would be able to reduce the vulnerability of different communities by helping users in making correct decisions on how to prepare them against disasters.

133 - Fabrication of Conducting-Polypyrrole-based pH-Sensor Doped with HQS

Daniel Tyson Ty, Eryc Austin Lin, Maria Carla Manzano, and Enrique Manzano

Physics Department, De La Salle University

The use of pH sensors for determining the presence of hydronium ions through electrodes has been present for a long time. The standard glass electrode has been used for precise measurement of pH levels. Polypyrrole has garnered a lot of attention in research because of its chemical and mechanical properties that might be useful in many applications. It also has been found to be highly sensitive to change in pH levels and showed a possibility to become a cheaper alternative to other materials. The use of polypyrrole in pH sensors from the previous researches had sometimes showed inaccurate results and low durability. HQS as a dopant and anion salt has shown to improve the linearity and effectivity of the pH sensor. In this study, conducting polypyrrole films are electrochemically synthesized in an aqueous solution containing pyrrole as monomer and HQS as dopant and anion salt. Different dopant concentrations are used to enhance the linear response to increasing pH and stability of the pH sensor. Gold plating and oxalic co-doping are also done to determine their effect on the durability and stability of the pH-sensor.

134 - Entropy-based Image Indexing and Retrieval System using FPGA

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Image histogram is widely used as basis in computation of entropy for content-based image retrieval, however different images having similar distribution on the histogram can be falsely detected as similar images. In this study, a system is proposed whereby the image is segmented into $m \times n$ blocks and the entropy of each block is computed based on its color histogram. This method aims to improve the accuracy of the image retrieval. The query image will undergo the same process to compute for its entropy. In retrieving images from the database, the similarity between two images is computed using Euclidean distance. Images that have least distances are included in the list of candidates for the query. The researcher wishes to establish the relationship between the number of partitions to the accuracy and speed of the proposed system. FPGA implementation will be carried out in order to verify the suitability of the proposed algorithm for real-time application.

135 - Implementation of Serial ATA Physical Layer using RocketIO in Virtex 4 FPGA

Cesar A. Llorente

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Serial ATA (SATA) protocol has gained prominence as the standard for data storage, replacing the parallel ATA (PATA) standard. The reason for this is the very high data rates supported by the standard up to 6 Giga bits per second, provided a low-cost solution for high-capacity, high speed storage for

laptops, desktops and even in database servers. Crucial to a successful implementation of the standard is the Physical Layer (PHY), where serialization/deserialization of the data, encoding /decoding and signaling are carried out. The PHY layer of SATA II has been verified and implemented on Virtex 5 and Virtex 6 family of FPGAs. However, there is a lack of reference designs that can be used for a successful implementation of the PHY layer of SATA II on Virtex 4 FPGAs. In this study, the implementation of PHY of SATA will be explored in order to provide a reference design that can be used in the implementation of the complete SATA protocol using the Virtex 4 FPGA family. The Xilinx Core generator will be used to configure the Multi Gigabit Transceivers in Virtex 4 FX60 found in the ML410 FPGA Embedded System Development Platform. Test benches in HDL will be written and together with the CHIPSCOPE PRO, the functionality of the MGTs to support the SATA PHY layer can be verified. The contribution of the study will be the reference design of implementing the PHY layer of the SATA protocol which can be integrated to a SATA Host Controller. This will make interfacing of a SATA hard disk drive to the ML410 FPGA Embedded System Development Platform possible. Future research directions will be the development of a SATA II host controller, interfacing of a SATA II compliant hard disk drive, development of the Host Controller Interface, and porting of the Linux operating system into the ML410 FPGA Embedded System Development Platform.

136 - The Effect of Cobalt-60 Irradiation to Physiochemical Properties of Ground Beef and Pork with Resveratrol

Jhustine Klien Mababangloob, John Anthony Tagacay II, and Jade Dungao Trono

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Irradiation of ground pork and ground beef will be tested for pH levels, lipid oxidation, and volatiles present after being treated with an antioxidant. Irradiated meats shall be compared to a control set-up wherein an antioxidant will not be introduced. The paper aims to see if addition of antioxidant will further increase shelf-life without compromising normal meat conditions. The objective of this work is to determine the effect of Cobalt-60 irradiation applied before or after cooking on the chemical properties of ground beef and ground pork, injected with resveratrol during storage and to provide information on controlling the quality of precooked or cooked irradiated meats injected with resveratrol. Standard grade beef and pork will be purchased from a local grocery store then prepared in 5 different conditions namely (1) non-irradiated raw meat, (2) irradiated raw meat, (3) non-irradiated cooked meat, (4) pre-cooked irradiated meat. (5) irradiated and then cooked meat samples. Resveratrol will be added to the ground meat samples prior to irradiating using a blender. Cooking of irradiated or non-irradiated meat will be done in a package at 85°C in a water bath to an internal temperature of 75°C. After cooking, meat samples will be repackaged in oxygen permeable bags and then will be subjected to either frozen storage or irradiation then frozen storage. Irradiation will be done using a Cobalt-60 source at 5kGy. Samples will be analyzed at 0 day and 3 months of storage at -10°C. Meat samples will be homogenized in 10 volumes of deionized distilled water and centrifuged at 3000g for 15 min. The pH of the supernatant will be measured using a pH meter. Lipid oxidation will be measured by a TBARS method expressed as mg of malondialdehyde (MDA) per meat. For the determination of volatile compounds present, GC/MS (Gas Chromatography/Mass Spectrometry) would be used. The number of harmful volatile compounds decreased as indicated by the low TBARS and PV values, that the shelf-life of the meat increased with the addition of resveratrol.

137 - Cobalt-60 Dose Calculations Using MCNP Methods in Gold Embedded Tumor and its Significance on Radiation Therapy

Jowi Tsidkenu Cruz, Abigail Rodriguez, and Jade Dungao Trono

Physics Department, De La Salle University

The introduction and development of gold nanoparticles has led to studies dealing with its potential for medical imaging and diagnostic applications. Gold is a high atomic number Z material (Z=79) and absorbs x-ray within the range of available medical modalities. In theory, the dose delivered to a tumour can be enhanced by loading high Z-material into the tumour. This results in greater photoelectric absorption within tumour than in surrounding tissues. Most anti-cancer agents do not greatly differentiate between cancerous and normal cells, leading to systemic toxicity and adverse effects. This greatly limits the maximum allowable dose of the drug. In addition, rapid elimination and widespread distribution into targeted organs and tissues requires the administration of the drug in large quantities, which is not economical and often results in undesirable toxicity. To know how GNPs significantly affect tumours, simulations using Monte Carlo N-Particle methods were conducted to determine the amplification brought by 1 mg/g, 7 mg/g, 18 mg/g and 30 mg/g GNP-concentrations. All simulations included the irradiation of a 30 cm x 30 cm x 15 cm water-volume phantom with the 5 cm x 5 cm, 10 cm x 10 cm, and 20 cm x 20 cm initial beam field sizes of 1.17 MeV and 1.33 MeV Co-60 source. Statistical comparisons were done using Analysis of Variance (ANOVA) and T-test to determine the relationships among the data parameters garnered.

138 - Marikina Flood Mapping System

Miguel Ramon Antonio A. Portugal, Oressa R. Prodigalidad, Terence C. Siy, Alfredo A. Verzosa, and Ma. Victoria Pineda

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Disaster preparedness is in line with preventing and alleviating human suffering to protect the life and health of human beings. Its main objective is to predict and prevent, as much as possible, the impact of disasters to the people. Marikina City's current disaster preparedness activities are based from their experience from typhoon Ondoy wherein several barangays were greatly affected by flood. They base their actions from the river water level to which 15 meters signifies the start of preparation and 16m signifies the start of evacuation. These alarms are then disseminated to the people with the use of sirens situated on the riverbanks. They had no way of knowing how high the river water level would be at a given time, they would only be waiting for it. Marikina doesn't have their own rain gauges, instead they call on another government office to acquire data on the intensity of rainfall on the mountains from which the water will then be going down to Marikina after few hours. They use the data to come up with assumed values to when and how much it would add up to the rivers of Marikina. Through requirements gathering, prototyping and user testing, re-using of software components, and the use of ICT, the group was able to develop the system that is intended to be of help to the Marikina Disaster Risk Reduction Council (MDRRMC), the Rescue 161, the citizens of Marikina. The system intends to aid in forecasting the impacts of the river water level and rainfall intensity considering the land area and altitude of each barangay in a span of two hours from the time the data was gathered and recommend evacuation as needed. Aside from this, it also aims to aid in disseminating the information to the public with the SMS blast. In using the system, MDRRMC will have records of the typhoons to hit them and be able to generate the reports that may of help for future reference on creating disaster management plans and decisions. With this, the city will more prepared and casualties can be minimized.

140 - Avenues for Green ICT in Philippine Outsourcing industry towards Sustainable Development

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Achieving sustainable development has been one of the vital areas that is being addressed nowadays. With the increasing importance of taking care of the environment, these two words have evolved from an option to a way of life. Based from an initiative by the United Nations, the organization has come up with a firm definition of sustainable development; a development that meets the needs of the present without compromising the ability of the future generations to meet their own needs. Given that Outsourcing industry grows aggressively, it contributed significantly to the economic progress of the Philippines this past years. Moreover, with the increasing demands, it provided Filipino workers more work in the Philippines. As a matter of fact, in 2009, IT and BPO revenues totaled for more than \$7.2 billion and the Philippines represented 21% of the total offshore BPO market. Moreover, given the large workforce of this industry, the ICT utilization of this industry has increased as well. This paper upholds the idea that ICT has the capacity to support sustainable development through greening the Outsourcing industry as well as the ICT that acts as backbone to its operations. Recognizing the strong links between these three variables; sustainable development, green ICT and Outsourcing industry, the paper will create a Green ICT framework that is supported by green MIS level policies, theories and best practices that will contribute to the growth of Outsourcing industry and to the preservation of the Philippine environment.

141 - A Study on the Effect of Copper Addition on the Catalytic Performance of Ni/AC Catalysts for the Thermocatalytic Decomposition of Methane

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The thermocatalytic decomposition (TCD) of methane is a rapidly emerging process for the production of hydrogen energy that has recently garnered the attention of researchers because of its potential as a major source of clean fuel. Nickel catalysts are commonly used because of its high catalytic activity. However, supported Ni catalysts tend to deactivate early at very high temperatures. Thus, this study investigated on the effect of copper loading on the catalytic performance of Ni/AC catalysts at various reaction temperatures. The copper loading was varied from 0%, 5%, 10% and 15%, while the nickel loading was constant at 6.7%. The reaction temperatures tested were 600°C, 750°C and 900°C. The reaction was carried out in a U-tube quartz plugflow micro-reactor loaded with 300 mg of the catalysts, and was allowed to proceed for 8 hours or until the catalyst deactivated. The results showed that the highest initial methane conversion of 29.95% and hydrogen yield of 0.599 moles H₂ per mole CH₄ were observed on the Ni/AC catalyst without Cu loading at 900°C. However, this catalyst deactivated quickly after 3 hours on stream. On the other hand, the Ni-5%Cu/AC catalyst at 900° had an initial methane conversion of 27% and initial H₂ yield of 0.540 moles, but a slower catalyst deactivation was observed due to the positive effect of Cu loading on catalyst stability at high temperatures. Meanwhile, the catalysts with 10% and 15% Cu loading exhibited lower methane conversions even though the copper loading for these catalysts was higher. This is attributed to the blocking of active sites on the catalyst surface. Post-characterization of the spent Ni-5%Cu/AC catalysts used at 750°C and 900°C showed that filamentous carbon or carbon nanofibers were deposited on the surface during the reaction. TGA profiles indicated that the solid carbon particles were multi-walled carbon nanotubes, and SEM images confirmed the fiber-like appearance of the carbon deposits, corresponding to filamentous carbon. In conclusion, the Ni-5%Cu/AC catalyst at 900°C resulted in the best catalytic performance for the TCD of

methane for hydrogen production, and valuable carbon nanotubes were also obtained from the carbon deposits on the catalyst surface.

142 - PARAGON e-Participation System: Utilizing ICT in the Philippine Legislation

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Good governance is one of the most vital components in every country all over the world. Most of the time if not always, this becomes a basis for evaluation to a particular country in terms of its development. Locally, the Philippine government is not responding adequately to the prioritization of ICT as means toward development. An explanation to this is the networked readiness index of a country or factors of environment, readiness and usage within it where results show that most of the countries worldwide like the Philippines are not yet ready on what ICT can do for their development. This research project basically looks deeper into governance problems where ICT solutions can be applied particularly in the legislative branch of the Philippine government. It mainly focuses on problems in the law making process and the case investigations done within the legislative branch where good laws are made with the joint efforts of bureaucrats, legislators and citizens. This is in the hopes that good governance can be achieved by applying e-Governance and e-Participation concepts which pushes a more effective, efficient and democratic government. The main problem here is that current efforts of the government in terms of informing and engaging citizens to participate are insufficient to properly motivate citizens in participation caused by ineffective venues to participate. Thus citizens lack representation in the lawmaking process. There is also inefficient transparency and accountability since citizens have difficulties in accessing public documents. By thorough interviews and analysis of the whole lawmaking and case management process, the proponents were able to develop an integrated bills management, content management and decision support system which support the e-Participation concepts that address problems on citizen participation in the legislative process. Through this, the proponents assume that Senate users can now easily track and manage documents while citizens can easily access public documents and are now able to give feedback on them thus, being able to contribute in the decision making within the lawmaking process. Since such ICT solution has never been used in the country, there are no studies yet that will prove it truly effective.

001 - The Development of the Anti-Rinderpest Vaccine: A Great Contribution of the Philippines to the Scientific World

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Rinderpest or cattle plague is a viral disease that decimated thousands of carabao and cattle in the Philippines during the late nineteenth century until the American period. Based on available data, it was estimated that about 90% of the total number of bovine animals in the country was decimated by the disease. To address the threat of this dreaded epizootic to the country's livestock and agricultural sector, the American colonial government developed various prophylactic products against the plague. Using several scientific journals published during the American period as sources, this paper traces the historical development of the different prophylactic treatments used and developed by the American colonial government to combat rinderpest. It examines how the anti-rinderpest bile, serum and vaccine were developed and applied in the field. It also explains the strengths and weaknesses of the different prophylactic treatments used by the colonial government to eradicate cattle plague in the country. The paper argues that the discovery of the anti-rinderpest vaccine was not an easy task because it was a trial-and-error scientific research. Government resources were used to finance the development of sera and vaccines against the disease. Just like any other scientific discovery, the vaccine underwent several tests experimentations before it became an effective cure against the contagion. Through the efforts and dedication of American and Filipino veterinarians, namely, William H. Boynton, DVM, Stanton Youngberg, DVM, Teodulo Topacio, DVM, Ildefonso Patdu, DVM, Manuel Robles, DVM, Juan Generoso, DVM and Major Raymond Kelsner, the eradication of rinderpest in the Philippines became possible in 1939. This great achievement in Philippine veterinary science was given recognition by the Rockefeller Foundation when the organization called the anti-rinderpest vaccine as the greatest contribution of the Philippines to the scientific world.

002 - Assessing the Impacts of the Food and Non-Food Grant on Poverty Alleviation in the Philippines

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There is an ongoing debate as to the effectiveness of food grant versus a non-food grant. This study aims to determine which program is more effective and efficient in addressing welfare issues such as health, nutrition, and education of the family members who are most vulnerable to economic shocks. Two programs will be compared and evaluated, the Food for School Program (food grant) and the Pantawid Pamilyang Pilipino Program (non-food grant). The effects of these programs on the target of enhancing retention rate through active school participation and reducing hunger will be determined using the Generalized Method of Moments (GMM). The statistical significance of the estimates will allow this study to determine the effectiveness of such programs as well as to verify which between the food grant and non-food grant is better in alleviating the state of poverty.

007 - A Venn Diagrammatical Analysis of Set Membership and Identity

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In set theory, Venn diagrams are used to represent collection of sets and analyze their relationships among one another. Thus, Venn diagrams are used to represent the intersection between two sets ($A \cap$

B), the union of two sets ($A \cup B$), the inclusion of one set to another ($A \subset B$), and other set theoretical notions. Venn diagrams, along with the basic principles of set theory, are also used in elementary logic to represent categorical statements and evaluate categorical syllogisms. Thus, the four basic categorical statements (A, E, I, O) have their respective Venn diagrams. Also, the validity of categorical syllogisms is easily determined by using Venn diagrams. Though the Venn diagram is a powerful analytic tool, it still has limitations. For one, it fails to provide analyses of some basic notions in set theory: notions like membership (e.g. $a \in A$) and identity of individuals (e.g. $a = b$). Correspondingly, it also fails to represent categorical statements of the form “a is F” and “a is b.” And finally, it could not account for the validity of some obviously valid inferences (e.g. All men are mortal. Socrates is a man. So, Socrates is mortal). In this paper, I offer a way of supplementing the rules of the Venn diagram so that it could surpass these limitations. To go about this, I take the standard principles of Venn diagrams at face value. Next, I add some formation rules that would account for membership and identity. Note that these rules are consistent with the rules of first-order logic. Finally, I shall demonstrate how this reformulated Venn diagram technique is supposed to work.

011 - Interspatial Differences in Purchasing Power: Another Perspective in Sending Remittances

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Various reasons have been put forward why migrant workers send remittances to their home countries. These motivations range from altruism to insurance, strategic, and investment reasons. However, another important possible reason which has not yet been fully explored theoretically and empirically is the role of interspatial differences in purchasing power. If migrant workers earn not that much in destination countries why do they still have excess funds to send remittances to their home countries? A possible answer to this question is the higher amount of real goods and services that their money can buy if it was used for consumption in the home country than in the destination country. Given this backdrop, the paper attempts to theoretically prove that differences in purchasing power across countries will have different bundle of goods at the prevailing exchange rate. As a consequence, a rational consumer will remit funds to the home country to maximize his utility given the differences in purchasing power across countries. The study attempts to establish an interspatial utility function which states that an individual's utility is represented by a combination of domestic and foreign consumption, where the former involves the consumption of the individual's household in the home country, and the latter involves the consumption of the individual himself in the host country. To empirically verify this, we can show that relative price ratios between countries have significant relationship with the amount of remittances coming from various destinations with different consumer price indices. If indeed this motivation is theoretically sound and empirically verifiable, the paper can contribute to the growing literature on motivations to remit and can likewise utilized as an input in policy formulations on managing the impact of remittances on the macro-economy.

012 - Magnification of Cognitive Thinking in Two Learning Settings

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This article is the Author's Master's Thesis that determined the effectual strength of Constructivist Learning Settings that utilized the Problem- Based Learning and Non- Problem- Based Learning Approaches in magnifying the cognitive responses of students in the Tertiary Level. Students are

selected using the Modified Regression Discontinuity Design and are evaluated using researcher- made pre and post- program performance measures.

020 - Describing the Geometric Reasoning of Fourth Year High School Students Using the Van Hiele Theory

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The research examined the geometric thinking of thirty fourth year students of a regular public school in Caloocan. The thinking levels of students were evaluated based on the Van Hiele model. This model assumes that with proper instruction, students pass through five levels of thinking arranged hierarchically. The achieved Van Hiele levels of students were analyzed vis-à-vis the misconceptions. The list of different types of misconceptions was adapted from Atebe's (2008) study on the same subject. The data gathering instrument is composed of sets of questions that typify each level. The implementation was done in a form of individual interview protocol so that probing questions was possible. From the computed scores, the Van Hiele level of each student was determined via success criterion. Misconceptions, on the other hand, were examined from the interview transcripts. The exhibited misconceptions were then used to analyze the way students think and the probable approach on how the geometric concepts were taught to these students. Results reveal that 60% of the respondents achieved the most basic level (visualization); on the other hand, only 10% attained level 2 (analysis), roughly 13% succeeded on level 3 (abstraction) and 17% of the students got the highest level (deduction). Every type of misconception forwarded by Atebe (2008) was manifested in students' answers while other forms of misconceptions were also found. Results show that the Van Hiele Levels and academic grades of students in Geometry are weakly correlated. Since most of the students have attained a Van Hiele level of one, it was inferred that they were not able to acquire the geometric concepts completely which is far inconsistent with their received academic grade in Geometry. The same can be concluded from the misconceptions discovered from the interview. It was assumed then that the poor performance exhibited by the students could be rooted from how the geometric concepts were taught to the students in their class.

021 - Baseline Taxonomy of Personal Entrepreneurial Competencies (PECs) of Selected DLSU Entrepreneurship Students

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With the recent graduating batch of entrepreneurship students' low interests of continuing their ventures outside the academic program, the effectiveness of the curriculum is questioned. From a systems' standpoint, the inputs and the transformation process that produce the final product should be considered. Since various researches confirmed that entrepreneurship can be taught, this research aims to determine the transformation process appropriate to develop entrepreneurs among these students. This research used the PEC worksheet by Management Systems International (MSI) to profile pre-existing competencies of the entire batch of ID 110 Entrepreneurship students during their first major course. Self rating scores were interpreted based on the PEC scoring system classified into achievement, planning, and power clusters. Using hierarchical cluster analysis of mean scores of respondents per competency, three clusters of PECs was formed. Using gender as a classifying variable, K-means cluster result confirmed formation of three groups segmented into the following types: Cluster 1 comprised of 89.5% male members exhibiting lowest OS, PER, COM, DQE, IS and SPM; Cluster 2 composed of 93.8% female members with lowest RT, PN, SC, and GS; and Cluster 3 with 10.5% and 6.3%, male and female

members, respectively rated highest in all PECs. Strengthening achievement cluster for males due to lowest scores in opportunity seeking (OS), persistence (PER), commitment to work contract (COM), demand for efficiency and quality (DQE) is appropriate; while power cluster for females need to be enhanced due to low scores in persuasion and networking (PN) and self confidence (SC), at the same time risk taking (RT) was found to be lacking. Across genders, planning cluster should be cultivated due to lowest scores in information seeking (IS), systematic planning and monitoring (SPM), and goal setting (GS). Overall, only a handful or 8.6% scored high requiring majority or 91.4% of the sample more intensive curriculum to develop these competencies. Afterwards, these have to be translated into action to unleash entrepreneurship among the youth.

023 - "Human is Not a Dirty Word": In Defense of Anthropocentrism

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Anthropocentrism or human-centered environmental ethic focuses on human beings' response to what is happening in the environment. It takes different forms like an absolute belief that human beings are above the environment and the nonhuman beings living in it because they alone possess intrinsic value. Moreover, there is also a more subtle one like the idea that nonhuman beings have inherent value but incomparable to that of a human being. Hence, any act towards nonhuman beings is always justifiable provided that it promotes the interest of a human being. Environmental ethicists do not make a conscious claim that they are indeed supporters of anthropocentrism. When they try to refute one another's point of view, the accusation of being an anthropocentric as such is always taken into consideration. The labelling does not sound good especially to those who blame the destruction of the environment to this ethical perspective. The topic of this paper is about anthropocentrism and the causes that it can bring to the nonhuman realm. This paper delimits its focus to anthropocentrism in relation to nonhuman animals. Its main objective is to prove that anthropocentrism is the best environmental ethic to address animal issues such as obligations, right and care. It is important to show the role that the ethic of care plays in support to this claim. It is true that anthropocentrism could be held responsible to so many environmental destructions and sufferings that nonhuman beings are experiencing. However, if taken into a different context, it can actually be the solution to prevent cruelty to take place. In that regard, anthropocentrism is not destructive. Through the ethic of care, compassion and empathy will be actualized. In the long run, it can lead to a humane treatment to nonhuman animals.

027 - Why the Parable of the Wedding Banquet as Metaphor for Kingly Leadership is Problematic: Towards a Rereading of Matthew 22

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Throughout the history of the Christian Church, local practices of toleration have been interspersed with pogroms and persecution. As such, it appears that St. Augustine of Hippo (354-430) was the most influential theorist of persecution. He interpreted the Parable of the Wedding Feast (Matthew 22) to justify coercion of heretics. The latter was a particularly long stretch, because the parable merely has a rich man prepare a banquet and send his servant out into the streets to find people and "compel them to come in." Later in Church history, both Catholics and Protestants justified forced conversions on the basis of this invitation to a feast. My thesis in this paper is: the kingdom of heaven is present in the Parable of the Wedding Banquet (Matthew 22) in the one lonely figure who refuses to wear the clothing (conduct) of a violent, unjust, life-destroying ruler who will kill others, even the friends he had invited to

a party, on a whim. An important, but often overlooked, theme in the Gospel of Matthew is the Messianic Banquet. Matthew's use of the Messianic Banquet theme is a key component of Matthew's theology concerning the nature of the Church, Israel, and the future of the true people of God. Hence this paper will attempt a fresh approach to the question of the relationship between the Church and the unity of its members that is neither traditional dispensationalism nor covenantalism. I will conclude by pointing out that Matthew 22 is not really an image of God's judgment towards gentiles, even though it is about humanity's judgment upon those who reveal God's kingdom. I will also highlight that the attitude of the King who ordered his servants to "go to the street corners and invite to the banquet anyone you find" (Mt. 22:9) should not be interpreted as representative of Jesus' attitude towards those outside the Church.

033 - English Corpus Linguistics at De La Salle University: Remembering the Past, Living the Present, and Creating the Future

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It is not too assuming to claim that De La Salle University (DLSU) was the birthplace of (English) corpus linguistics in the Philippines. The first-ever mega-word Philippine corpus was compiled at DLSU with the leadership of Ma. Lourdes S. Bautista; the corpus is the Philippine component of the International Corpus of English (ICE-PH). Several groundbreaking works came out with the availability of this ICE-PH and these works have been associated with DLSU, if not totally based at the University. In 2000, Bautista conducted the first analysis that used ICE-PH in an attempt to define the grammatical features of Standard Philippine English. She as well as other linguists and scholars has looked into specific grammatical features of Philippine English (Phile) and some also made comparisons of Phile with other Englishes, using other components of the International Corpus of English. The most recent major work that makes use of ICE-PH as dataset was the grammar of the verb in Phile, which was prepared by Borlongan (2011). Two other major (Philippine) English corpora are also based at DLSU – the Philippine database of the Corpus of Asian Magazine Advertising of Danilo T. Dayag and the Philippine parallel to the Brown University Standard Corpus of Present-Day American English of Ariane Macalinga Borlongan. The last mentioned corpus has particularly introduced a diachronic way of analyzing (the grammatical features of) Philippine English, which was not previously possible. This paper aims to summarize the work that has been done in English corpus linguistics at DLSU, report on the current activities in the University, and chart future directions that would impact the bigger community of English corpus linguists not only in the country but the world.

037- The WebQuest: Its Impact on Students' Critical Thinking, Performance, and Perceptions in Basic Physics

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The purpose of this study was to determine the impact of WebQuest learning on students' critical thinking skills, content- knowledge acquisition, task performance and perceptions. Twenty students from a private secondary school in Muntinlupa City received WebQuest instruction for an hour a day for 17 weeks. The critical thinking skills were measured using the Cornell Critical Thinking Test –Level X after instruction. The change in content acquisition skills of the students were obtained by comparing the results of the pre-test and post-test California Physics Standard Test. A five-point Likert scale questionnaire was administered to obtain information about the students' perceptions. Unstructured interviews and classroom observations were done to corroborate with the findings from the tests on

critical thinking and knowledge skills. The results of this study supports that WebQuest activities have a positive impact on students' critical thinking, content-knowledge acquisition, and perceptions. Deduction aspect of critical thinking skills was best demonstrated by the students while assumptions identification was the least demonstrated by the students. In addition, there was a low to moderate relationship between students' critical thinking and their task performance.

041 - An Assessment of the Spatial Intelligence and Pattern Recognition Skills of Tertiary Students of De La Salle University

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It is a common misconception for students to define mathematics as learned by repetitive memorization and other procedural, symbolic skills. In addressing this issue, previous research has suggested that the use of spatial objects in mathematical instruction can actually improve mathematical understanding. Pattern recognition is an important skill in mathematics. Therefore, the higher the ability to interpret and to understand the world around us implies the higher ability to construct and connect mathematical concepts. The primary purpose of this study is then to further observe, investigate and prove if a relationship exists between spatial sense and pattern recognition. In establishing that connection, spatial sense as a required skill in the curricula of higher mathematics will then be promoted. This study analysed data from a sample size of 60 undergraduate students from De La Salle University. Two assessments were utilized, which were tested for reliability, to measure both the spatial sense and pattern recognition of each participant. Results have shown that most of the participants had an average score in both tests and a few scored exceptional or poor scores. Furthermore, it showed that there is a strong relationship between spatial intelligence and pattern recognition. As mentioned in the literature, this proves that the use of visualization in the daily classroom instruction of mathematics can enhance the student's mathematical understanding. Moreover, the findings clearly emphasize the need to reconsider and adjust the current curriculum and that the use of spatial figures such as; manipulatives, drawing shapes, folding nets, three dimensional solids, and the like should be used in media of mathematical instruction. Consequently, the ability in connecting, representing, and reasoning with mathematical language is greatly enhanced.

053 - The Relationship Quotient of Family Owned Businesses

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Businesses that are owned and/or managed by members related to one another are classified as a family business. They exist worldwide and they contribute to the economic activity of a country by providing employment and additional sources of products and services from which the consumer may choose from. With their presence in the economy, studies about them become an interesting topic to explore on. Therefore, this study was done in order to determine the relationship quotient of selected family owned businesses. Hoover (1999) defined the relationship quotient as the whole range of interpersonal behaviors that reflect the capacity of individuals to establish and maintain a significant social, family and work relationships. For family owned businesses, it is crucial that they have a healthy relationship with their family members since a healthy relationship can be the basis of a healthy business. The study is descriptive in nature as it presents the level of relationship quotient of the selected family owned businesses. The relationship quotient is based from the level of relationship paradigm and relationship skill of the respondents. The relationship paradigm was measured in terms of

level of trust, respect, confidence, sharing and well-being of the group. While relationship skill was measured in terms of the communication process, problem solving technique, planning skills, organization skills and manner of managing differences by the group. The instrument administered to the 100 family owned businesses was the relationship quotient questionnaire of Edwin A. Hoover, PhD and Colette Lombard Hoover, M.S. taken from the Relationship Intelligence Handbook. The questionnaire aimed to assess the level of relationship intelligence among family members working in the business and it has 35 items grouped into three categories namely: relationship paradigm, relationship skill and motivation. The respondents are family owned businesses and were selected through a purposive sampling technique. Data analysis includes the frequency and percentage distribution of the relationship paradigm, skill and motivation level. The study also presented the implication to a family business belonging to a particular quadrant in the matrix. Overall, the results presented a comprehensive view of the relationship landscape of the selected family businesses.

055 - A Documentary Analysis of Major Examinations in Selected Subject Areas as Validated by Experts: Reference for Test Construction Enhancement

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Over the years, it was found out that based on personal experience, observation and discussion with colleagues in the institution that most faculty members claim that test construction represents not only the biggest challenge in their teaching career but also of the job they least like. In the attempt to provide a framework of faculty training program, particularly on test construction on the basis of reliability and validity, the study utilizing content analysis procedures ventured to assess selected major examinations constructed by the faculty members of the College of Arts and Sciences and College of Nursing of Manila Tytana Colleges (formerly Manila Doctors College) if they conform to the Table of Specifications based on the evaluation of external experts/validators using the validated rubric. The study was done in three phases: Phase I included the construction of a researcher-made rubric. The rubric was validated by an expert outside the Manila Tytana Colleges before this was used to evaluate the selected examinations; Phase II included the selection of 4 sets of examinations administered last AY 2010-2011 from the two colleges namely College of Nursing and College of Arts and Sciences. The examinations have at least eighty items using the multiple-response type of questions with a maximum of six choices and a minimum of three choices. The examinations taken were Pharmacology and Medical-Surgical Nursing from the College of Nursing while English and Chemistry were taken from the College of Arts and Sciences; and Phase III of the study included the gathered and treated data based on the scores given by the experts using a 5-point scale. Data analysis made use of descriptive statistics and in-depth textual analysis. The evaluation of the external experts on the classification of objectives of the selected examinations were compared and analyzed considering the following variables: students' use of decision strategies; organization and presentation; use of outside support and readings; alignment to classification under table of specifications; and language and grammar.

058 - Technology Acceptance of Philippine Early Childhood Teachers

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Teachers should embrace the use of technology and integrate Information and Communication Technologies (ICTs) in their curriculum. This study examined the technology acceptance of ninety-four (94) Philippine early childhood education teachers in terms of their competence in using technology,

attitude towards technology and practices in using technology. It was found that the participant teachers have sufficient competence in using technologies; have positive attitude towards technology; and have used technology in their practice. These three components of technology acceptance correlate with each other. Analysis of variance reveals significant differences in the components based on various external variables, such as their training and hours on computer for personal use. It is suggested to provide training to further improve their technology skills and to help them facilitate student-centered use of technology, as well as provision of more technology options to early childhood students.

067 - Symmetricity of Cost Behavior

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Recent studies have challenged the traditional symmetrical cost behavior model. Using panel data analysis, this study finds that listed Philippine firms exhibit asymmetrical cost behavior known as sticky cost. However, cost stickiness disappears when a more complete adjustment cycle is considered. Firm- and industry-specific characteristics also influence the degree of cost stickiness.

068 - Using TUG-K and TUG-M in Probing Students' Understanding of Kinematics and Mathematics Graphs

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This study is an attempt to explore the connection between possessing good graphical skills and good understanding in kinematics through graphs. Beichner's Test for Understanding Graphs in Kinematics (TUG-K) was used for this purpose. At the same time, a parallel test was constructed to probe understanding in mathematical graphs, the Test for Understanding Graphs in Mathematics (TUG-M). The TUG-M underwent content validity as well as reliability test. After pilot testing and item analysis, the final form of TUG-M consisted of 21 multiple choice questions with items similar to those in TUG-K. The two tests were given to 155 engineering students in a university in Metro Manila. Results showed that while students performed poorly in both tests, they scored relatively better in TUG-M (mean ~10) as compared to TUG-K (mean ~5). In addition, it was found that there is a moderately low correlation between performance in the two tests ($r = 0.40$). Hence, knowledge of graphical skills does not necessarily imply sound understanding of kinematic concepts.

074 - Lessons in Operational Risk Management: What the University can Learn from a Commercial Bank

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This study seeks to determine whether one commercial bank's experience in managing operational risk can be applied to an academic institution like De La Salle University. At present, a commercial bank's operational risk is embodied in the so-called Basel Accords that identify operational risk as a failure of people, process, systems or technology, and external events, risks that an academic institution also faces. Using a proven training module that includes a self-assessment questionnaire, the study will also use the results of this questionnaire in order to identify the various risk control mechanisms that can be applied by the bank and the University. The output is expected to be general framework that can help the University craft its own operational risk management framework as well enhance enterprise risk management in an academic setting. It is envisioned that the study will yield a rich area of possible future studies along the lines of enterprise risk management and operational risk management.

075 - Promoting the Philippines as an ESL (English as a Second Language) Destination to South Koreans

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Knowing the large market for foreign students who want to study English overseas, the Philippine Department of Tourism has promoted the Philippines as the ESL (English as a Second Language) destination in Asia. As such, foreign students who want to study English in the Philippines can apply for a Special Student Permit (SSP) under the Philippine Bureau of Immigration (BI). These include South Koreans who topped the list of foreigners with valid Special Student Permits. Other nationalities on the list are Japanese, Chinese, and Taiwanese. Since other countries are emerging as ESL destinations, how do we promote the Philippines as an ESL destination to South Korean students? Aside from the fact that English is a global language, South Koreans want to study English to travel overseas and to get better jobs. The results showed that respondents studied English in the Philippines because of knowledgeable teachers, conducive school facilities and cheaper costs compared to studying in other countries and in South Korea. Other factors were the satisfactory course content, the encouraging teachers and the many opportunities to practice in the Philippines.

076 - Bayesian and Traditional Epistemology: Is there a Bridge?

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There are a number of reasons why many epistemologists from both camps are skeptical of any project that attempts to build a bridge between Bayesian and traditional epistemology. Central to these objections are two points of disjuncture: 1) traditional epistemology regards knowledge as an all or nothing affair while Bayesian epistemology admits of degrees of 'credence' corresponding to probabilities and 2) traditional epistemology assumes the *factivity* of knowledge while Bayesian epistemology lacks any 'objective' criterion of truth. 1 and 2 lead to the view that a bridge cannot be built since there is no point of connection between the two. One way of countering this simple argument is by offering points of convergence. I will identify four, here expressed in four theses which I will defend in this paper: 1) rational degrees of belief is equal to degree of justification, 2) some positions in traditional epistemology admits degrees of belief, 3) Bayesian principle of Conditionalization may be interpreted as an account of justification, and 4) one's posterior probabilities is one's degree of justification. The objective here is to motivate the bridge building project by arguing for its possibility. The bridge building task would be carried out on a latter work.

078 - Estimating the Social Cost of Fossil Fuel as a Source of Energy: The Case of Davao City

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The energy and transportation sectors' increased dependence on the importation of fossil fuels poses an energy security problem for the country. Though fossil fuel is not abundant in the country, there are other sources of energy, specifically renewable energy that is waiting to be tapped. With the approval of the Renewal Energy Act of 2008 and the formation of the National Renewable Energy Board, the path towards renewable energy becomes clearer. As of November 2010, there are 205 contracts awarded for renewable energy production estimated to produce 4,568 megawatts (MW), more than half of the contracts are for hydropower while production is mainly attributable to geothermal energy (NREB,

2011). However, the proximity of the country to the equator makes it a potentially large producer of solar energy, but currently, there is only one solar energy firm with a capacity of 1 MW. The researchers are interested in showing the costs and benefits of producing renewable energy specifically solar energy in Davao. Davao has recently expressed its intent to speed up the construction of a coal plant to solve the power shortage in the province. However, they fail to account the environmental cost of using coal, which is a form of fossil fuel. This study aims to produce a comparative analysis between coal and solar energy distribution which will provide a clear path for Davao's energy policy.

080 - The Vulnerabilities of Southeast Asian Countries to Global Warming

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Southeast Asia (SEA) has been industrializing and developing through the years. Except for countries like Malaysia, Brunei, and Singapore, SEA countries have been relying on its natural resources as the primary source of economic input. Countries like Thailand, Indonesia, the Philippines, and Vietnam have become exporters of agricultural and forest products to countries around the world. Being agricultural nations, most of the people in the region still rely on farms, plantations, fisheries, forest products, and tourism as their primary source of income. These resources of income are very vulnerable to weather patterns and changes. This vulnerability of SEA resources is raising concerns in light of the worldwide issue on global warming. For past four decades, scientists around the world gathered data supporting the theory that the average world temperature is steadily increasing. This increase in temperature may be attributed to a number of reasons but research showed that there is a correlation between the increasing concentrations of greenhouse gases, primarily carbon dioxide and methane, in the atmosphere. These gases create a "greenhouse effect" that causes global warming. Global warming is believed to cause sea level rise, flooding, stronger typhoons, droughts, coral bleaching, loss of biodiversity, and others. This study identified the specific vulnerabilities of SEA as a region side by side with the theorized effects of global warming. The vulnerabilities are further discussed in conjunction with issues of economic development and poverty. Data used in this study were primarily obtained from sources in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. It was found from secondary data that throughout the past 100-150 years, the number of occurrences of the effects of climate change in SEA countries also increased. The increase and decreases in frequency was found to have a positive correlation with measured levels of carbon dioxide in the atmosphere. As such, SEA countries such as the Philippines must focus on disaster preparedness and educating its population on abating the negative effects of climate change in the country's economic, political, and social status and thus move to a more climate-friendly way of life.

081 - An Investigation of Selected High School Students' Pattern Recognition Skills When Graphing Linear Equations with Graphmatica

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Graphing equations is essential to the students' understanding of the theoretical side of algebra. This requires students to recognize patterns and make their own generalizations based on their graphs. In line with this, researches show the importance of using a tool that could enhance their pattern recognition skills, as well as their conceptual learning of algebra, which would further help them in making their own discoveries and communicating their learning through self-made generalizations. This

quantitative research sought to investigate the effect of using the graphing software, Graphmatica, in graphing linear equations on the high school students' pattern recognition and ability to generalize. The students' responses in the form of observed patterns in graphs and self-made generalizations during the diagnostic test, the activity with the use of Graphmatica and the activity without the use of Graphmatica were described and analyzed statistically through the non-parametric measure, Wilcoxon Matched Pairs Test. Moreover, the model of pattern recognition processes of Palmario et al. (2009) was interrelated with the use of the software as a tool that could influence the said skills. The results of the investigation lead to the conclusion that the students' performance levels in pattern recognition were highest during the activity that made use of the software. Statistical evidences further confirm that the use of Graphmatica helped the students graph equations more accurately, visually and analytically recognize patterns and, consequently, provide self-made generalizations from correct patterns observed. These evidences, however, showed that there were no significant differences among the students' ability to make generalizations during all three tests. There was improvement, but it was not statistically significant enough to be considered. It was therefore concluded that through the aid of a computer graphing software such as Graphmatica, only the students' pattern recognition when graphing linear equations was improved.

086 - Are we Achieving By Rote-Learning or by Making-Meaning?

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According to SAL Theory, how students learn can be defined as learning approach. Different from learning style which is a permanent trait developed independently of school, learning approach is an adoptive trait developed in school. Two learning approaches, namely, the surface approach (rote-learning) and the deep approach (making-meaning) can be extracted by instruments like the one used in the study. In connection, the study asked– “Were the freshmen of the only free tuition-fee public college in Meycauayan, merely memorizing or were truly learning by understanding? How was it affecting their numerical literacy?” The answers were sought by aiming to (1) quantitatively and qualitatively validate the instrument for the target population, (2) determine the relationship between learning approaches and numerical literacy, (3) determine whether the numerical literacy scores differ between surface learners and deep learners, and (4) profile the individual and class mean learning approach. Confirmatory Factor Analysis and in-depth interview were used to validate the instrument. Spearman Rank Correlation Coefficient was used for the relationship between learning approach and numerical literacy. Independent Samples t-test (equal variances assumed) was used to differentiate the numerical literacy scores between surface and deep approach. Mann Whitney U Test was used to determine whether the difference between the mean surface scores and mean deep scores per class was statistically significant. Consequently, the study found out that the instrument had weak factor validity but had effectively identified a surface cohort and a deep cohort. The strong divergence between the two approaches was satisfactorily confirmed. However, it was found that numerical literacy and learning approach had no significant relationship. It was also found that numerical literacy does not significantly differ between the deep and the surface cohort. In contrast, the surface approach was statistically found rampant in the higher sections. With these findings, the study posed the need for instruments with stronger validity for learning approach and for numerical literacy. The weak factor validity had implications on the level of achievement of the students which seems to be low and on the current entrance examination of the school which seems to be a weak predictor of performance.

087 - Developing Mathematical Skills of High -Functioning Autistic Children Using the Realistic Mathematics Education (RME) Approach

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Autism is one of the five Pervasive Developmental Disorders (PDD), which are characterized by widespread abnormalities of social interactions and communication, and severely restricted interests and highly repetitive behavior. The purpose of this study was to evaluate the effectiveness of the Realistic Mathematics Education (RME) approach in developing mathematical communication and problem-solving skills of ten children diagnosed with autism but classified as high-functioning. The RME approach, a research-based instructional strategy based upon real life experiences was implemented over the course of two months in selected schools in Batangas where the children are enrolled. The A-B-A-B Single-Subject research design was employed using discrete trial training to mark the students' progress. The researcher recorded the level of assistance needed to accomplish given tasks in the areas of mathematical communication and problem-solving. Results show that the training of teachers and the exposure of the students to the RME approach lead to an improvement of the students' ability to communicate mathematically and solve problems meaningfully.

088 - Assessing the Proportional Reasoning of Students through a Learning Package using Understanding by Design Framework

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The purpose of the study was to evaluate the effectiveness a learning package on ratio and proportion inspired by the Understanding by Design. The design plan of the learning package was evaluated by two groups of evaluators, namely subject matter experts and teacher-evaluators. An intact class of La Salle Green Hills in Mandaluyong City during the SY 2010-2011 was chosen to try out this design. The implementation stage was evaluated by both teacher-observers and the subjects of the study by using evaluation checklists. The study also aimed to find out if the model used in this study had an impact in the pupils' understanding of the topic. The study used both qualitative and quantitative methods of research. Results show that both the subject matter experts and teacher-evaluators gave a high rating to the Learning Package on Ratio and Proportion inspired by the Understanding by Design Framework. Their overall ratings have moderate agreement. This indicates that the indicators consistent to the principles of the backward design framework are highly evident in the learning package. The teacher-observers gave an excellent rating to the implementation of the learning package on ratio and proportion. The pupils also gave a high rating to the implementation of the learning package. These means that the indicators consistent to the principles of the Understanding by Design have always been observed by them. The pupils got low scores in the pretest which implies that they had either low level of proportional reasoning ability or no sense of proportionality. In the posttest, the overall mean score of the pupils is higher compared to the mean in the pretest. The overall standard deviation of the posttest score is also lower compared to the standard deviation in the pretest. These indicate that the pupils have increased their understanding of ratio and proportion. In order to determine if there are significant changes in the pupils' understanding of ratio and proportion, the Paired Samples t-test procedure was used. The Paired Samples t-test procedure compares the means of the pre-test and posttest. The significance value obtained the Paired Samples t-test procedure at 95% confidence is 0. This indicates that there is a significant difference between the means of the pretest and posttest. This

explains that the pupils have higher scores or performed better in the posttest than in the pretest. In addition to the Paired Samples t-Test procedure, the categorization of the level of proportional reasoning of the pupils before and after the implementation of the learning package on ratio and proportion were compared. Before the actual lesson, majority of the pupils, more than half, were categorized as non-proportional reasoners. After the implementation of the lesson, majority of the pupils have advanced to the higher levels of proportional reasoning.

110 - Artificial Qualia, Intentional Systems and Machine Consciousness

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In the field of machine consciousness, it has been argued that in order to build human-like conscious machines, we must first have a computational model of qualia. To this end, some have proposed a framework that supports qualia in machines by implementing a model with three computational areas (i.e., the subconceptual, conceptual, and linguistic areas). These abstract mechanisms purportedly enable the assessment of artificial qualia. However, several critics of the machine consciousness project dispute this possibility. For instance, Searle, in his Chinese room objection, argues that however sophisticated a computational system is, it can never exhibit intentionality; thus, would also fail to exhibit consciousness or any of its varieties. This paper argues that the proposed architecture mentioned above answers the problem posed by Searle, at least in part. Specifically, it argues that we could reformulate Searle's worries in the Chinese room in terms of the three-stage artificial qualia model. And by doing so, we could see that the person doing all the translations in the room could realize the three areas in the proposed framework. Consequently, this demonstrates the actualization of self-consciousness in machines.

113 - Exploring the *Imago Hominis* in Artificial Intelligence

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Since the beginning of the twentieth century, the progress in computer technology situates humanity in a continuing process of designing intelligent machines from mechanical computing devices to vacuum-tube computers to integrated circuit computers. In science fiction films, we were informed about intelligent machines through the characters like K.I.T.T., R2-D2, C-3PO, Commander Data, etc. Moreover, artificial intelligence (AI) project at the Massachusetts Institute of Technology brought the development of humanoid robots like Cog and Kismet. With the emerging reality of AI, human beings have been given a way to design an image. What image of the human being can be pushed through in designing intelligent machines? Moreover, what is the "image" of a human being? A biblico-theological understanding of creation brings about the recognition that human beings are created in the image of God. How can this AI enterprise give light in our understanding of humanity as created beings in God's image? The continuing process of designing an AI has implications in our own perspective on humanity, as well as, on our life in relation with God and other created beings. The paper uses theory of mimesis in this theological inquiry on human beings as *imago Dei* or image of God and so as on artificial intelligence in relation to *imago hominis* or human image. Thus, the paper does not only present theological understanding of human beings as created in the image and likeness of God. But also delve with the understanding of intelligent machine as a way of re-presenting, re-creating, extending human characteristics and capabilities to act, think, relate, and even live in this world.

114 - A Conceptual Framework for Assessing Cognitive Work Ability among Intensive Care Unit Nurses

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Work ability has been verified to decrease with age, thus affecting the quality of work of a person over time. Mental declines are also associated with age, thus leading to difficulties in the performance of their regular work, characterized by increased occurrences of errors, poorer perceptual feedback and differences in work outlooks. This poses a critical issue for jobs that involve high mental workloads but have decreasing supply of labor. With the world experiencing an elder boom, there is a need to maximize available human resources by preserving the work ability of adults even as they age. Although several studies have been conducted on the physical and affective aspects of the original Work Ability Index, few have discussed the cognitive aspect, namely the attention of workers, memory and other intangible factors. This study aims to fill this gap in the original Work Ability Index by proposing a conceptual model called the Cognitive Work Ability Model (CWAM). Cognitive Work Ability is the ability of a person to fulfill mentally demanding tasks and serves as a more comprehensive measure of the mental aspect of work ability. The proposed model states that attention, perception, responsiveness and working memory influence mental capacity which interacts with task structure and work environment to form CWA. CWA consequently influences response selection, execution and eventually performance quality. To demonstrate an application of CWA, a specific case in intensive care nursing was used, since ICU nursing has been defined as a mentally demanding type of work and there is presently a worldwide aging and decline of the nursing population. Cognitive task analysis was used to break down common nursing tasks and key factors for manipulation were identified, each relating to the elements of CWA. Multiple linear regression was also used to demonstrate that the existing WAI and WHO Quality of Life indices insufficiently predict the mental capacities of individuals, thus supporting the usefulness of CWA. A methodology for validating the model involving software design, design of experiments and principal components analysis was then explained together with potential applications of CWA in healthcare for further study.

117 - A Study to Determine the Factors that Contribute to the Secondary School Students' Choice of an Undergraduate Program in the Philippines

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Determining the reasons for the secondary school students' choice to enter science and engineering undergraduate programs is important for a developing country such as the Philippines in its desire to become industrialized. These reasons are also important to the higher educational engineering institutions in their unceasing desire to recruit more students in their various programs, in particular, those programs which need more participation. There are four themes that arise in the discussion of factors determining students' choice of undergraduate programs: school science background (course participation), student's attitudes toward school science, perceptions of other factors that influence the students' career choice and students' perceptions of their own personality. This research made use of Woolnough (1991) instrument, its effectiveness is implied by interest among researchers in administering this in their higher education systems. Respondents of the study are students from secondary schools in Metro Manila. The students were chosen from a list of schools within Metro Manila. Twenty students were requested by the Guidance Counselor of each school to answer the survey instrument. From the responses gathered, cross-tabulations of male and female students' career choice and their parents' occupation and education were obtained. Chi-square was applied to test the

relationships among students' career choice and their parents' occupation and education. Factor analysis was applied in student's attitudes toward school science, perceptions of other factors that influence the students' career choice and students' perceptions of their own personality. The results indicated that male and female high school students differ in their inclination with regards to career choices. This is particularly evident in the physical science career choice which was selected by more male students. The parents' occupation has a direct link on the students' choice of science careers. The findings showed that the physical science career choosers decide on their 2nd and 3rd years, therefore, an early start for marketing physical science undergraduate programs could be done. Students of both genders expressed a positive view on exposure to practical science application as a significant factor in the choice of career in science and engineering. They stated that teacher-controlled activities are a strong influence in their career decisions. Among the students, the science-career choosers regarded job advantages or job security as more encouraging than did the non science-career choosers. Students generally regarded themselves as sociable and capable of being a leader. They are open to new ideas, they are creative, confident in processing ideas and abstractions, and they are self-reliant.

125 - On Habit Persistence and Demand for Money: The Case of the Shopping Time Model

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Analysis of the money demand in monetary economics provides a venue for the inclusion of the general price level and inflation in the overall macroeconomic stability which enables the monetary authority to implement proper monetary policies. Although there are several school of thoughts in consider how money should be treated in the analysis, the shopping time model considers money as an intermediate good that is held by households to reduce shopping time. The shopping time model concludes that given an increase in shopping time relative to leisure would increase money demand and with the inclusion of shopping time, households have less time for leisure and/or work thus less income for consumption. This paper attempts to verify whether the findings of the shopping time model will be robust to minor changes in the households' utility function and changes in the shopping technology to represent the rise of online shopping.

128 - Examining the Relationship Between Oil Firms' Inventory Strategies and Industry Demand-Supply Shocks: A Game Theoretic Approach

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The inelastic nature of demand for petroleum products has given key players in the oil industry market power to control its price, through setting their desired output at a given period of time. These firms have the option to sell immediately, engage in derivative contracts or store the goods with the intention of selling them at a later time. Given that a firm's primary objective is to maximize profits, its optimal input-output combination will be determined largely by various macroeconomic variables among which include prevailing and expected values of market prices, interest rates, foreign exchange rates, and economic growth. Beyond the effects of internal shocks, a firm's production decisions will also contingent upon the occurrence of external shocks and unforeseeable events such as natural disasters, social unrest, and the discovery of resource (i.e. oil) deposits. Utilizing a game-theoretic approach, this paper aims to construct a model that will illustrate how a firm's profit-maximizing strategy responds to various exogenous shocks which past literature has not accounted for. Results can shed light on how oil price volatility might be explained by firms' production decisions which are themselves subject to uncontrollable circumstances. In addition, a potent explanation as to why the Oil Deregulation Law's

objective of forwarding competitive prices within the industry has not been achieved yet can be obtained. Lastly, this study will examine the economic conditions and market structures that make it possible for firms to hoard huge amounts of the said commodity.

131 - The Great Learning Experience Project: An Attempt to Understand Learning from the Views of the Millennial Learners

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Millennial learners are individuals born after 1985 with very wide exposure to various types of media enhanced by technology. They are persons who had listened to music while in the womb of their mothers and had watched television starting at age 0. Most of them would have had a music player or a game pad or a mobile phone at age 8. (Deterle, Dede and Schrier, 2008) These millennial learners grew up with constant web connectivity at their fingertips to assist them in their homeworks. The present pedagogies our academic institutions employ to support the learning style of the web generation of students may not be as suitable. Social constructivism, transformative learning or problem-based learning, while prevalent in the Asian context, may be more perfect for cognitively dynamic students. Our students nowadays are more adept to constructing knowledge, content (Attwell, 2007) and even more independent in their learning priorities. This study attempts to understand the new learning practices among our students. This study attempts to find out how college students define what a good learning experience is. It is also the intention of the study to explore new educational practices and hopefully drive ways of designing and developing the future of learning activities. The study was conceived in May 2011 and was planned to collect data in the form of short videos in a span of six months, from June to December. There will be two sets of samples, one from the students of De La Salle University of the Philippines (DLSU) and the other from the students of University West (UW) in Sweden. The experiment asked for a two minute video that will be created and expressed by an individual or group of students. This meant planning and organization to compose the thoughts, the message and the content of the video. Since this contains the expression of the students themselves, the self-expression equates to a great degree of authenticity. This paper will impart the work-in-progress of this experiment, the Great Learning Experience. To date, there are twenty videos from DLSU and fifteen videos from UW. This paper will tell the methods used in the different classes and the initial findings. Comparison of the UW and DLSU videos is not included in the paper.

139 - The De La Salle University 100 Schools Project: Implementing an Instructional Design Framework for High School Teachware

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De La Salle University, a leading Catholic University in the Philippines, is celebrating its centennial year of service and presence in the archipelago. With this inspiration De La Salle's College of Education and College of Computer Studies have collaborated to develop Teachware (A software using Multimedia and Instructional Design to teach various classroom lessons) applications for 100 public and private schools to advance teaching and delivery of topics in Math, Science, and English to first year high school students. The project was labeled the DLSU 100 Schools Project. In the course of data gathering, it was unveiled that there is still the huge problem of the absence of Instructional Design in the classrooms, and if there is, the Instructional Design is poorly implemented. Lack of tools such as Teachware and other instructional tools are also experienced in high schools. Further, there's inadequate training for

teachers to be able to use whatever technology tools are available. These issues have anchored the creation of the DLSU 100 Schools Project. The project aims to assist in educational development of pre-defined public and private institutions to promote training to teachers and administrators, extend De La Salle's services through its extension programs and share resources through educational software that will aid the targeted 100 schools in their teaching of basic subjects. This paper presents the Instructional Design Framework intended to cater to the DLSU 100 Schools Teachware design and development, cascading to teacher training. The project was undertaken by Instructional Systems Technology students, under the supervision of the College of Computer Studies. The software is mainly developed using Adobe Flash, all the while implementing sound Instructional Design to the Teachware. The data collected from User Acceptance Tests during the Tanauan teacher training last May 2011 show initial results about the project. The Instructional Design Principles of Merrill (2007) is used in the study, guided by the Understanding by Design Framework of Wiggins & McTighe (2006) for selection of topics and content.

143 - Teachers' Attitude and Self-efficacy Towards the Use of Computers: Implications for Teacher Training and Research

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This study aimed to examine the attitudes toward computer and perceived self-efficacy in the use of computers among 237 basic education teachers in Metropolitan Manila. A 21-item Likert type Computer Attitude Scale (CAS) was utilized to assess computer attitudes covering four components: affective (feelings towards computers), perceived usefulness (beliefs about the usefulness of computers in their job), perceived control (comfort or difficulty of using computers) and behavioural intention (behaviours and actions with respect to computers). While a 32-item Likert type Computer Efficacy Scale (CES) was used to measure individual teachers' self perceptions of confidence surrounding particular computer-related knowledge and skills. Descriptive statistical measures were used to describe the profile of the teacher respondents relative to computer use, attitude and self-efficacy. The overall computer attitude indicated that the teachers hold positive attitude towards the computer (M: 3.6385, SD: 0.62248). Results revealed significant associations between attitude towards computer and perceived self-efficacy ($r=0.427$, $p=0.001$) and between the teachers' computer self-efficacy and their perceived control to use the computer ($r=0.583$, $p=0.001$). Computer attitude subscores of perceived usefulness was also found to correlate with computer self efficacy ($r=0.447$, $p=0.001$). Present findings yielded no significant differences in computer attitudes among the teachers in terms of their gender and level taught. However, there were significant differences in the computer self-efficacy and frequency of use between male and female teachers. Implications for teacher training are drawn and potential topics for further research are discussed.

144 - Playing with Equations: Exploring How Engineering Students Solve Physics Problems

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This study employed the Classic Grounded Theory to explore how engineering students solve Physics problems. Six engineering students enrolled in Physics 213 (Electricity and Magnetism) were sampled. The data gathered from these samples include field notes, retrospective unstructured interview, and solution sheets. *Lead and link*, a conceptualization technique first appeared in this paper, was used in

the conceptualization stage. A conceptual lead is an emerging or discovered indicator and/or concepts that need to be sampled and observed in the succeeding set of data. This conceptual lead becomes the conceptual link and basis for further theoretical sampling. Conceptual development and saturation in this technique is easily tracked down because as defined, saturation is a state when there is no need to further sample. Meaning, when there are no more conceptual leads identified, the concept has achieved saturation. "*Playing with equations*", an in vivo term, emerged as the core category. This category was subjected to thorough conceptualization, raising its indicators from empirical to higher conceptual levels. Conceptually saturated, playing with equations is defined in this paper as solving problems entirely by manipulating equations. To wit, it is a problem solving strategy that involves *identifying applicable equations, identifying or deriving the suitable equation, and verifying answers by trial and error*. The role of the problem solver employing this strategy is to scout for the best equation to solve the problem and plug the given variables and/or constant values to obtain the correct answer. Applicable equations are random equations that students retrieve with the hope of using them in the solution process. Playing with equations is treated in this paper as a process that starts in the identification or listing down of applicable equations. The manner and mechanism of retrieving these equations and its implication to understanding the problem is not part of the set goal for saturation. Furthermore, the only checking step indicated in this paper is verifying by equations. Verifying by equations for students who employ playing with equations is simply trial and error of various equations and comparing the obtained results. Other mechanism to verify an answer either did not yield rich empirical indicators during the selective coding process or did not emerge at all. This is suggestive of another area to pursue in the future. A grounded elaboration of the old-aged problem in solving Physics problems, specifically in engineering education is presented and results show that engineering students, even on their second Physics course, solve problems according to their mastery of equations. Result further shows that the strategy fails in practice. Finally, result suggests a need to revive scholars' dying interest to problem solving research.