



## Eyeglass Localization for Low Resolution Images

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**Abstract:** Facial data is a necessity in facial image processing technologies. In the context of facial expression recognition, there are a number of approaches taken to extract the features of the face during the pre-processing phase of the facial data. However, there are instances when there are objects and artifacts that compromise the reliability and usability of data such as eyeglasses. Active shape models and active appearance models are commonly used in facial recognition and biomedical image segmentation. Active shape models and active appearance models are trained with webcam images to detect eyeglass objects in facial data to be used for preprocessing such as the removal of eyeglasses. The basic approaches are followed where a set of images with varying lighting and angles is marked with landmark points and then used as training sets for Principal Component Analysis. For efficiency and minimization of unnecessary processing, a new feature was added, the nose. Comparison of the two approaches is based on the accuracy of unseen test data, the performance with respect to the output shape and which approach performed better with fewer features. The mean square error (MSE) over the results of the proposed methods is used to evaluate the performance. The performance with respect to output shape is measured through the mean square error of the predicted localization to the actual contours of the test set. The active appearance model performed well with satisfactory results and improved speed. While training sets that included additional features had better performance in use compared with eyeglass only sets. The addition of the nose proved to have contributed to the effectiveness of the localization method.

**Key Words:** Image reconstruction; Face feature Extraction; Object Localization; Active Shape model; Active Appearance Model