

**Universiti Teknologi MARA**

**Cosmetic Face Reconstruction  
Based on Morphable Model and  
Principal Component Analysis  
Technique**

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## ABSTRACT

Face reconstruction has passed through many phases and challenges over the years. Cosmetic face reconstruction or plastic surgery is one type of face reconstruction. It is a process of recreating the face of an individual by reconstructing a new face model. This research is focus on cosmetic face reconstruction to improve or change the physical appearance which is the face of human being. It involves medical and image processing area, such as artistry, forensic science, anatomy, anthropology and osteology. The purpose of cosmetic face reconstruction is to help people in need of reconstructing or remodeling their faces by using a suitable technique. For this project, the reconstruction is based on Morphable model and Principal Component Analysis (PCA) technique. Morphable model is used because the characteristic of Morphable model that is easy to control the complex facial attributes of the image. PCA is feature construction or extraction and data representation technique that is widely used in computer vision, image processing and pattern recognition. PCA can efficiently represent images of human faces and furthermore, the PCA technique can reduce the dimensionality of the large data and bring out strong patterns in a data set while remains most of the variance which is important to the reconstruction of the face model. The result is evaluated by measuring the accuracy of the reconstructed images.

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