**Facial Image Reconstruction Using Elliptical Approximation and Convex Hull**

Abstract:

Computer Vision along with Image processing is one of the most interesting and rapidly developing fields in computer science. It has many applications like face detection and recognition, character recognition, finger print matching, body imaging etc. One of the main application areas in image processing methods is to extract the pictorial information for human face interpretation.

Face Recognition confronts innumerable hurdles in the form of variations in lighting conditions during image capture, Occlusions, damage in facial portions due to accidents etc. The application of Facial Image Inpainting also fails when the occlusions or the deformities are present across the boundary of the object of interest (face), since the bounds for the application of the inpainting algorithm is not precisely defined. Hence recovery of the complete picture of a human face from partially occluded images is quite a challenge in Image Processing.

Facial imaging is the method of generating 3D body data of a subject. This process involves receiving one or more images of the subject from a digital imaging device (Cameras in Smartphone, tablet or PC) and applying algorithms for edge recovery of the face. Then the segments of one or more images are analyzed to determine the probability that the subject is located in the segment. Then the process of facial imaging continues with identifying one or more distributions within each partitioned image, where each distribution relating to a property of those images is selected. Then to produce one or more unique probability maps representing the subject, the probabilities and distributions are utilized. Then followed by comparing one or more unique probability maps with a database of representations of 3D bodies is carried out to determine the best mapping between each unique probability map. Finally the representation determined from the database is used to generate 3D facial data of the subject based on the best mapping.

**GitHub Link:**https://github.com/vinayraaj/FIREACH