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Pre-Operative Tool for Facial-Post-Surgical Estimation and Detection

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Abstract : Goal: Purpose of the project was to make a plastic surgery prediction by using pre-operative images for the plastic surgeries’ patients and to show this prediction on a screen to compare between the current case and the appearance after the surgery. Methods: To this aim, we implemented a software which used data from the internet for facial skin diseases, skin burns, pre-and post-images for plastic surgeries then the post- surgical prediction is done by using K-nearest neighbor (KNN). So we designed and fabricated a smart mirror divided into two parts a screen and a reflective mirror so patient's pre- and post-appearance will be showed at the same time. Results: We worked on some skin diseases like vitiligo, skin burns and wrinkles. We classified the three degrees of burns using KNN classifier with accuracy 60%. We also succeeded in segmenting the area of vitiligo. Our future work will include working on more skin diseases, classify them and give a prediction for the look after the surgery. Also we will go deeper into facial deformities and plastic surgeries like nose reshaping and face slim down. Conclusion: Our project will give a prediction relates strongly to the real look after surgery and decrease different diagnoses among doctors. Significance: The mirror may have broad societal appeal as it will make the distance between patient's satisfaction and the medical standards smaller.

Keywords : k-nearest neighbor (knn), face detection, vitiligo, bone deformity
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