HAIRCUT RECOMMENDATION SYSTEM BASED ON FACE SHAPE PROPORTIONS AND HAIR DENSITY USING CONVOLUTIONAL NEURAL NETWORK (CNN)

Supervised by Ery Setiyawan Jullev Atmadji, S.Kom, M.Cs

Adji Prasetya Nugraha
Study Program of Informatics Engineering
Majoring in Information Technology

ABSTRACT

Appearance plays an important role in the modern era, especially for young men who want to appear confident and attractive. Many people are often unaware of which hairstyle best suits their facial characteristics. A common issue encountered when getting a haircut is dissatisfaction with the final result. An unsuitable hairstyle can reduce an individual's self-confidence. Therefore, this study aims to develop a CNN-based hairstyle recommendation system capable of identifying a user's face shape, hair density, and hair type as the basis for providing suitable hairstyle recommendations.The methods employed in this study involve several Convolutional Neural Network (CNN) architectures, namely MobileFaceNet, ResNet50, EfficientNetB0, and the ArcFace method. The datasets used include CelebA, UTKFace, K-Hairstyle, and the Hair Type Dataset. The experimental results show that the MobileFaceNet model achieved an accuracy of 83% on the CelebA dataset, while ResNet50 achieved an accuracy of 82%. Meanwhile, EfficientNetB0 achieved accuracies of 94% on the K-Hairstyle dataset and 84% on the Hair Type Dataset. The User Acceptance Testing (UAT) results indicated a user acceptance rate of 78.18%, which falls into the good category. The system was also successfully implemented as a mobile application that can operate offline.Based on these results, it can be concluded that CNN is effective for use in a hairstyle recommendation system because it is capable of extracting facial and hair features effectively and generating hairstyle recommendations that match the user's characteristics.

Keywords**:** *Convolutional Neural Network, Hairstyle Recommendation, MobileFaceNet, ResNet50, EfficientNetB0, ArcFace.*