

Age and Gender Classification from Facial Images Using VGG16 and Canny Edge Detection

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Estimating age and gender simultaneously from a single facial image is important for many applications. Although previous deep learning approaches have achieved strong performance in gender classification, their performance in age estimation remains limited, as they often fail to capture the shape and structural features crucial for accurate prediction. To overcome this limitation, this study proposes a dual-branch CNN model for joint age and gender estimation. The proposed approach takes a raw facial image and generates its corresponding edge map using the Canny edge detection algorithm. Features from the raw image are extracted using a pre-trained VGG-16 network, while those from the edge map are obtained through a customised CNN. The inclusion of edge-based features captures fine structural details, whereas channel and spatial attention modules enhance discriminative learning across both branches. Finally, the features from both branches are concatenated and processed through a series of fully connected layers for classification. In this work, age estimation is treated as a multi-class classification problem rather than regression, enabling group-wise age prediction. The proposed approach was trained and evaluated on the publicly available UTKFace dataset, attaining classification accuracies of 87.88% for gender and 60.00% for age prediction. Compared to state-of-the-art methods, our approach achieves competitive accuracy while using less than half the training samples, underscoring its efficiency and novelty.

Keywords: Age and gender estimation, CNN, edge detection