DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SCHOOL OF COMPUTING

ABSTRACT SUBMISSION FORM

10214CS701– MAJOR PROJECT

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SEMESTER: WINTER

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TITLE OF THE PROJECT:	**GENDER AND AGE ESTIMATION FROM HUMAN FACES BASED ON DEEP LEARNING TECHNIQUES**		
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ABSTRACT			

The estimation of gender and age from human faces is a vital research area with numerous applications, including security systems, healthcare diagnostics, targeted marketing, and human-computer interaction. With advancements in deep learning, techniques such as Convolutional Neural Networks (CNNs) and pre-trained models like ImageNet have significantly improved the accuracy and efficiency of these estimations. CNNs are particularly effective in extracting hierarchical features from facial images, while ImageNet, with its extensive pre-training on large-scale datasets, provides robust feature representations. This review examines the role of these techniques in addressing the challenges inherent in facial analysis.

The study explores various CNN architectures tailored for gender and age estimation, such as VGGNet, ResNet, and MobileNet, and highlights their comparative performance. It also evaluates the effectiveness of leveraging ImageNet pre-trained models for transfer learning, which reduces computational costs and enhances accuracy in tasks with limited labeled data.

The review discusses prominent datasets, including Adience, UTKFace, and MORPH, emphasizing their impact on training and testing deep learning models.

Key challenges such as variations in facial pose, lighting conditions, occlusions, and age progression are analyzed, along with mitigation strategies like data augmentation, ensemble learning, and fine-tuning pre-trained models. Furthermore, this review addresses issues of model fairness and bias, which are critical for ensuring equitable performance across diverse demographic groups.

STUDENT **PROJECT SUPERVISOR** **PROJECT CO-ORDINATOR**