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**PerfectFit-An Intelligent Fashion Recommendations System Combining Voice
input, Skin Tone and Body Shape Analysis, and Explainable AI for
Transparent and Personalized Style Guidance.**

A dissertation by
Ms. Gishya Iduwarie Mendis
W1898900 | 20211198

Supervised by
Mrs. P.R.H. Sachithra Vinodani Thilakarathne

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ABSTRACT

The PerfectFit solution addresses the challenge of accurately classifying women's body shapes from the uploaded images to provide personalized fashion recommendations. Traditional methods relying on manual measurement or surface classifiers are likely to fail on the richness of real images, with the variations of pose, lighting, and background. Existing fashion recommendation systems mostly ignore useful aspects such as skin tone and occasion that limit their personalization and user satisfaction. The basic problem therefore is to design an automatic, strong, and interpretable system that is capable of identifying body shapes well and merging multiple attributes of users to offer personalized advice on dressing.

To solve this problem, PerfectFit employs a deep learning approach founded on the MobileNetV2 convolutional neural network model. MobileNetV2 was chosen based on its trade-off between accuracy and computational expense that qualifies it for use in real-time scenarios. The model relies on transfer learning using the initialization of pretrained ImageNet weights followed by fine-tuning on a judiciously selected dataset of body shape images appropriately labeled. The architecture includes bottleneck residual blocks and depthwise separable convolutions to reduce model size without sacrificing performance. Additional layers such as Global Average Pooling and a Dense softmax output layer were added to classify five distinct body shape categories. Complementary modules for skin tone detection and explainable AI, powered by OpenAI's GPT-3.5, were integrated to enhance recommendation personalization and transparency.

Subject Descriptors: Computing methodologies -> Artificial intelligence -> Explainable AI -> Explainable machine learning Information systems -> Information retrieval -> Recommender systems -> Fashion and clothing

Keywords: Fashion recommendation, Explainable AI, body shape analysis