**Department of Computer Engineering**

**Human Body Size Estimation**

**BE Major Project – 1 (Semester VII)**

by

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**A. Methodology:**

**Comparative analysis of existing System:**

In existing projects, 3d cameras were used to capture the image. But it would not feasible for everyone to get access to it. It will also increase the cost and processing power of the device. Hence, we working on a model which takes 2D images as input and process it.

**Key factors for implementation of project:**

1. We are implementing this project in the Django so as that the webapp can be used across different platform and so the webapp will be platform independent.
2. First, we will implement Home page wherein instruction for capturing images would be displayed.
3. After that user will be prompted to grant camera access followed by a prompt to enter the height.

Reconstruction is done through HMR MODEL which is a pretrained model that creates 3D mesh for input image.

3D human body reshaping system consists of three parts, i.e., the Imputer, the Selector and the Mapper in both online stage and offline stage. In offline stage, the Selector takes the dataset of 3D body meshes and corresponding anthropometric parameters as inputs to learn the relevance masks by the proposed feature-selection-based local mapping technique. The mapping matrices are further learned by linear regression from the parameters selected by to mesh-based body representation.

**B. Workflow of the project:**

1. Obtaining User input through camera module.
2. Mapping of input image onto 3-dimensional model using 3D human reconstruction.
3. Extracting body measurements from the reconstructed model.
4. Classification of measurements based on size chart.

Obtaining User input through camera module:

Initially, if the user wants to buy cloths online, he has to capture the image through webapp’s camera by following the instructions given. Then the image will be captured if the conditions are satisfied or else user will be asked to recapture it.

Mapping of input image onto 3-dimensional model using 3D human reconstruction:

We will encode the 3D mesh of a human body using the Skinned Multi-Person Linear (SMPL) which will create realistic 3D model of the human body that is based on skinning and blend shapes and is learned from thousands of 3D body scans. So, this model will reconstruct the 3D human model.

Extracting body measurements from the reconstructed model:

For extracting body measurements from reconstructed 3D model, we will be using Anthropometric body reshaping techniques.

Classification of measurements based on size chart:

The measurements obtained from extractions are fed into classification model which will be trained based on different body constraints such as (chest, waist, etc) for classifying it into different sizes.

**C. Model and Data sets:**

For Human body reconstruction and Human pose detection we will be using a pretrained model from researcher Angjoo Kanazawa - Kanazawa AI Research (KAIR) Lab.

Different human body measurements will be used to train Classification model (Support Vector Model) which outputs size as per cloth measurement standards.