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PO-003 - (23766) - THREE-DIMENSIONAL VISUALIZATION OF MUSCULOSKELETAL CHANGES ACCORDING TO JOINT MOVEMENTS FOR DEVELOPMENT OF HUMAN MODEL

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Various realms such as education, research, industry, and healthcare are demanded for a deep dive into augmented reality. The existing CT images using cadavers are insufficient to explore the morphological changes of muscles and bones according to the joint movements. The purpose of this study is to obtain a dataset of CT/MRI images showing various movements of each joint from volunteers, segment the bones and muscles, and then to reconstruct to 3D images for a human model.

Forty volunteers were taken CT/MRI images of the shoulder, elbow, and knee joints. These images were taken at different angles depending on the movement of each joint. The bones and prime muscles have been reconstructed and visualized to in 3D models by software.

Five bones and 16 muscles in the upper limb, 5 bones and 8 muscles in the lower limb involved in joint movements have undergone 3D visualization. These 3D models were customized to display movements from different perspectives. Interactive visibility controls for each bone and muscle were designated and movement sequences were programmed for each motion.

This study successfully differentiates itself from existing single-modality studies by comparing CT and MRI data on joint movements of the same subject and visualizing them as a 3D model to build a highly accurate human model. These data will be used to build up a super-resolution, high-accuracy digital human model. This will also be used to implement educational programs to educate medical students as well as students in sports and various fields.

Palavras-chave : Human model, Visualization, Joint movement