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Development of 3D printed model of human knee joint from MRI and CT-based images

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Human knee structure is commonly viewed using medical images extensively in medical studies and medical professions. The visualisation of the knee has been improved as well as the anatomical structure and physiological processes. The research community participates to diagnose and treat medical problem related to human knee using theoretical and practical approaches. Moreover, Medical three-dimensional (3D) printed reconstruction have become common tools in education. However, Researchers have less attention on constructing 3D printed model by using real medical images and direct it for different uses in the educational platform. In this paper, 3D reconstructed anatomy structure consists of two steps: First, a medical image of Human Knee was used to design 3D reconstructed anatomy structure using 3D slicer workbench. Second, visualisation, the 3D printing machine were used to print the model by using Snapmaker Luban software. The segmentations of the knee consist of 5 parts – Femur, Tibia & Fibula, Lateral and Medial Meniscus, anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL), and Patella. The 3D model has been constructed and printed for visualisation and validation.