

ABSTRACT

Feet are an important part of the body in helping us to perform various activities. However, foot posture can become abnormal due to wrong habits in childhood which finally affects the efficiency of foot movement, risk of injury, and growth. With the risks involved, the diagnosis of abnormal foot posture is important. In assessing foot posture, doctors or experts make assessments using manual observation skills and simple tools so that if there are hundreds of patients, the accuracy will decrease and take a long time. Assessment of foot posture can be achieved by the Foot Posture Index-6 (FPI-6) method which has reliability and efficiency as a clinical standard for foot posture analysis.

In the previous FPI-6 research using 3D foot morphology image processing and feature extraction. In this study using the FPI-6 method, the development of a 3D image reconstruction method in less than 40 minutes and modification of the mechatronic design was carried out to obtain a 3D photogrammetric image with a smaller error value. The output of this system development is the selection of 3D Zephyr as photogrammetric software for the best image quality with a reconstruction process time of 2 minutes and 50 seconds with an error value of 3% and the main modifications of the mechatronic design, namely changing the background color to green, replacing the microcontroller with Arduino. UNO, added a bluetooth module, changed the height of the camera to the footrest by 20 cm, added a protective case and cooling fan.

Keywords: *Photogrammetry, 3D Image Reconstruction, Foot Posture Index-6 (FPI-6), 3D Zephyr.*