**Image processing based foot plantar pressure distribution analysis and modelling**

ABSTRACT

Although many equipments and techniques are available for plantar pressure analysis to study foot pressure distributions, there is still a need for mathematical modelling references to compare the acquired measurements. In order to derive formulas in this concern, this research proposes a measurement-based method which adopts the reference measured parameters such as; the weight of a subject, contact-area size, age, and the pressure level distribution over a plantar image captured by the EMED plantar pressure system. The proposed analysis and algorithm were verified by a group 79 volunteers through data collection with four various measurement conditions. Three mathematical modelling equations have been proposed that describe the relationships between the foot plantar pressure levels and the subject's body mass, foot size, and age. The modelling of foot plantar pressure could be useful for various applications such as gait analysis, hospitals, clinics, custom shoe making, and early detection of ulceration in the case of diabetic patients.

**Keyword:** Data analysis; Foot plantar pressure; Image processing; Mathematical modeling