ANALYSIS OF NORMAL AND ABNORMAL GAIT USING PRINCIPAL COMPONENT ANALYSIS (PCA)

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ABSTRACT

Gait classification is useful for diagnosis movement of lower limb. Where the lower limb have a lot of information that are needed in normal and abnormal motion analysis. Initial process to classify the gait is with characterization of gait. Principal component analysis (PCA) was used to characterize normal and abnormal gait pattern. Gait pattern data acquisition performed with using the Optotrak Certus 3020 against two of three normal subjects and abnormal subjects. Average results of the PCA analysis in normal subjects showed the value of the PC-1 = 1.62; PC-2 = 1.04; and PC-3 = 0.32. While the average on the subject showed abnormal values at PC-1 = 1.64 which has some similarities as normal subjects, PC-2 = 0.82 and PC-3 = 0.53. Therefore we can conclude that the results obtained in the characterization of abnormal subjects has some similarities to the PC-3 amounted 33.11%, PC-2 amounted to 78.01% and the PC-1 amounting to 99.22% of the normal character. The ability to distinguish normal and abnormal gait pattern can be seen in the value of the PC to the 2nd and 3rd at the PCA. It is concluded that PCA can classify normal and abnormal gait. It suggests that PCA can be used to diagnose gait abnormalities.

Keywords: Gait characterization, Gait feature extraction, Optotrak Certus3020, Principal Component Analysis (PCA)