

Cepstrum Analysis of Human Walking Signal

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Abstract : In this study, we propose a real-time data collection technique for the detection of human walking motion from the charge generated on the human body. This technique is based on the detection of a sub-picoampere electrostatic induction current, generated by the motion, flowing through the electrode of a wireless portable sensor attached to the subject. An FFT analysis of the wave-forms of the electrostatic induction currents generated by the walking motions showed that the currents generated under normal and restricted walking conditions were different. Moreover, we carried out a cepstrum analysis to detect any differences in the walking style. Results suggest that a slight difference in motion, either due to the individual's gait or a splinted leg, is directly reflected in the electrostatic induction current generated by the walking motion. The proposed wireless portable sensor enables the detection of even subtle differences in walking motion.

Keywords : human walking motion, motion measurement, current measurement, electrostatic induction

Conference Title : ICECECE 2014 : International Conference on Electrical, Computer, Electronics and Communication Engineering

Conference Location : Osaka, Japan

Conference Dates : October 12-13, 2014