

Acoustic based gait analysis & recognition ; A novel system for quantification of human motion.

Research hypothesis

The hypothesis of this project is that walking derived sound waves (i.e. steps sounds) comprises unique, specific and reproducible biometric features.

Research objective

The objective of this project is to develop an acoustic based system for gait analysis and recognition, which will model human locomotion based on walking derived sound wave output.

Specific aims

- To prove the above hypothesis that walking generates a unique acoustic “signature” which is both specific and reproducible features for each individual walker.
- To develop system for extraction of relevant features from an audio sequence. . This system could recognize spatiotemporal gait events and serve as a novel gait analysis modality. Further more it could o facilitate to improve existing gait analysis setups and be used for biofeedback therapy.
- To develop a data bank of acoustic biometric variants in normal subjects and in specific pathological conditions (i.g. neurological, orthopedic diseases). This system could potentially enable automatic diagnosis of specific clinical conditions as for follow-up of patients response to treatment.
- To develop “recognition engine” capable of performing recognition of individuals derived from an audio sequence of a person ambulating on a walkway. Such systems have a large amount of potential application in the field of security and alert.