A Symbolic Approach to Gait Analysis Using Inertial Sensors

Gait Analysis
Walking is an important activity and can reflect several aspects of one’s health. The clinical analysis of the human walk can improve the diagnosis and assessment of a number of physical and cognitive conditions such as stroke and Parkinson’s Disease.

The problem
Gait analysis is still not part of routine clinical practice due to the costs involved in training clinicians for observational gait analysis and setting up gait labs with motion capture technology. As a result, gait analysis remain limited to research or very specific medical cases.

The solution
Alternatively, inertial sensors can be used in the development of cheap and wearable gait analysis systems. Inertial sensors are cheap, and easy to embed into garments such as shoes. They can provide unobtrusive and continuous acquisition of important gait information for a greater number of patients.

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The challenge
Appropriate processing of the sensor data is important in the development of accurate and robust systems that can be widely accepted within the medical community. We propose a combination of data symbolization and expert knowledge that provides an intuitive and general analysis of the sensor data.

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