

## Development of a Low-Cost Smart Insole for Gait Analysis

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**Abstract :** Gait analysis is essential for diagnosing musculoskeletal and neurological conditions. However, current methods are often complex and expensive. This paper introduces a methodology for analysing gait parameters using a smart insole with a built-in accelerometer. The system measures stance time, swing time, step count, and cadence and wirelessly transmits data to a user-friendly IoT dashboard for centralized processing. This setup enables remote monitoring and advanced data analytics, making it a versatile tool for medical diagnostics and everyday usage. Integration with IoT enhances the portability and connectivity of the device, allowing for secure, encrypted data access over the Internet. This feature supports telemedicine and enables personalized treatment plans tailored to individual needs. Overall, the approach provides a cost-effective (almost 25 GBP), accurate, and user-friendly solution for gait analysis, facilitating remote tracking and customized therapy.

**Keywords :** gait analysis, IoT, smart insole, accelerometer sensor

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