



INVENTORS

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WIRELESS SHOE IN-SOLE SYSTEM IMPLEMENTATION FOR BIOMEDICAL APPLICATIONS

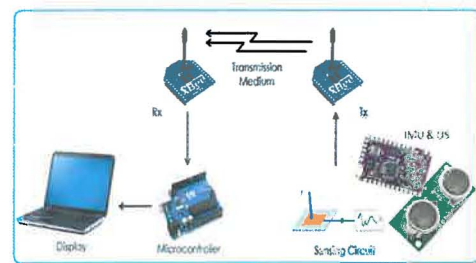


PRODUCT DESCRIPTION

WIRELESS SHOE IN-SOLE is a system to measure the orientation and pressure field that acts between the foot and the support surface during everyday activities.

This research focuses on the development of a portable shoe integrated with wireless and recent electronic based system. It goes with the custom design package includes pressure sensor, Arduino Uno microprocessor, XBee wireless signal transmission, ultrasonic, Inertia Measurement Unit (IMU) and power supply unit.

SYSTEM CONFIGURATION



PROCESS DEVELOPMENT



Figure 1: Gait Based Biometric Identification Process Flow

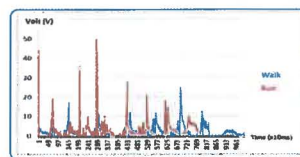


Figure 2: Zinc Oxide Thin Film Pressure Sensor Preparation

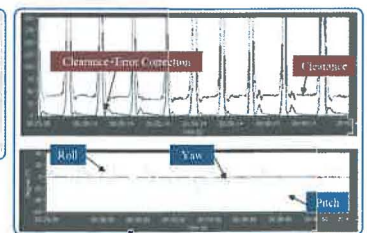
INVENTION ADVANTAGES

- Very Cost Effective
• Environmental Friendly
• Availability for Other Applications:
• Athlete performance monitoring
• Rehabilitation Monitoring
• Diabetic Ulcerations Detection
• Early Fall Prevention for elderly

RESULTS



(Single Cell) Voltage (weight) Versus Time (s). Comparison between two difference weight.



(IMU & Ultrasonic) Combination between leg orientation (roll, yaw, pitch), foot clearance and foot pressure mapping will provide specific identification for persons.

NOVELTIES

- In-house wireless system implementation.
• Towards Green Technology due to:
• No photolithography processes used
• Used active sensor (piezoelectric) that does not need an external power supply.

COMMERCIAL POTENTIALS

- Military army identification system with biometric applications.
• Gait analysis for rehabilitation monitoring at hospital.
• Universal athlete performance monitoring.
• Low cost for mass production (USD80/ unit for 100 units production)

CONCLUSION

The device with the custom design includes piezoceramic sensors, IMU, ultrasonic, Arduino microcontroller and XBee modules is successfully developed and analyzed for biometric application in real life time.

