

# Data-Driven Gait Detection for Single-Sensor Ankle Exoskeleton Control

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## Public-facing abstract

Ankle exoskeletons can make walking less costly, but many systems still depend on extra body-worn sensors that make everyday use clunky. This project takes a leaner route: it trains a machine-learning model to detect heel strikes using only one sensor embedded inside the exoskeleton clutch. In treadmill tests across different speeds and inclines, the model reached roughly 93 percent accuracy and 92 percent precision. The social promise is practical: fewer parts, easier setup, and a clearer path from lab prototypes to assistive devices people could actually use outside the lab.