

Enabling Smartwatch Biometrics in Constrained Environments

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This paper presents enhancements to an open-source smartwatch running the NuttX real-time operating system. The contributions made include developing a NuttX driver for the BMI085 inertial measurement unit (IMU) device, enabling accelerometer and gyroscope data processing from the device, creating a user-space NuttX application to test the driver functionality and data accuracy, and integrating an open-source pedometer algorithm with dynamic distance and calorie burn computations, designed for constrained environments, in the NuttX ecosystem. These contributions help bridge the gap between the hardware capabilities of the smartwatch and the actual applications and demonstrate the functionality of fitness tracking algorithms in computationally constrained embedded systems.

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