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Eric Payne
Cleveland State University

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Integrating an Android Device into Embedded Computer Systems

Washkewicz College of Engineering

Student Researcher: Eric Payne

Faculty Advisor: Pong Chu

Abstract

An embedded system is a computer system designed to perform a specific set of tasks such as a GPS device or a digital camera. An embedded system is composed of three major parts: a processor (CPU), input devices, and output devices. The input devices are peripherals to take user command (switches and keypad) and sensors to measure environmental conditions (barometer and accelerometer). The output devices are actuators that generate light and sound (LED display and amplified speaker) and moving parts (servo motor).

An important step in prototyping an embedded system is to design the input subsystem. It is traditionally done by selecting input modules and then developing hardware and software interfaces for each individual module. The undergraduate summer research is to use an inexpensive, entry-level, Android phone as a universal programmable sensor module. It provides a single unified interface and can be configured to replace a dozen commonly used input devices.