

Bluetooth Embedded System Monitoring: SmartMon

Dr. Michael Obara michael.obara@navy.mil
Mr. Nathan Brown nathan.t.brown@navy.mil

Background:

The US Navy utilizes a variety of embedded systems within sonar sensor arrays. They are typically installed in areas of vehicles or off-board sensor systems with limited accessibility. Currently, performance monitoring, fault localization and general debugging capabilities must be designed into the telemetry backbone that links modules to PC systems. This places limits on the amount of data that can be retrieved, and may require significant architectural changes to the backbone when new modules are added to the system. Wireless access to these embedded systems would provide access to hard-to-reach places and an interface that could be simply and quickly updated to suit new or improved embedded systems. An Android smartphone provides a powerful and convenient tool to perform the data collection.

Project Details:

This Capstone project attempts to build and evaluate a Bluetooth wireless link between an embedded system and Android smartphone in two phases. First, an off-the-shelf Bluetooth development system will be selected based on the results of a market survey and purchased. An application for an Android smartphone will be written by the URI team and demonstrated to link with the Bluetooth system. Simple data will be passed back and forth. Second, a custom Bluetooth circuit will be designed by the URI team and assembled by NUWC. This circuit will be designed with the goals of low power and minimal physical footprint, and will include a small PIC microprocessor. NUWC will provide the completed circuit board back to the URI team, who will develop code for the microprocessor. Similar to the first phase, software will be written to pass data back and forth. However, the phase two Android code will perform more sophisticated processing, possibly to include menu-driven control and graphical feedback displays. This project requires one electrical engineer and one computer engineer.

Development Stages:

- Market Survey
- Identification of Phase 1 data transfer protocols
- Software development for Bluetooth dev. board and Android smartphone
- Electronic circuit design
- Identification of Phase 2 data transfer protocols
- *Hardware Procurement and Assembly (NUWC)*

- Software development for Bluetooth dev. board and Android smartphone
- Demonstration