

Wearable Sensor Network Platforms
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Demo Abstract

The *UbER-Badge* and *Senseable* are platforms for research and application development for wearable sensing, processing, and communication. In this demonstration, the technical capabilities of these two platforms are demonstrated and the applications of the *UbER-Badge*, supporting the SPOTS paper “A Sensor Network for Social Dynamics”, are illustrated.

The *UbER-Badge* (UBiquitous Experimental Research) is a wireless sensor node and wearable display designed to facilitate group interaction in large meetings and acquire a wide range of data for analyzing social dynamics. Using its two channels of wireless communication, it can provide face-to-face transmissions of individualized data (via IR) as well as event-wide announcements and periodic sensor updates (via RF). The participants can use the badges to mark interesting people and demos to receive more information later. Other event-enhancement applications include personal and broadcast messaging, presentation time-keeping, and being able to locate another badge-wearer. A variety of sensor and inter-person interaction data are collected and used to analyze and predict the social patterns developing across the event.

Senseable is a wearable sensor system for real-time collective motion analysis. Each sensor node comprises a full inertial measurement unit capturing acceleration and angular velocity in three axes. The system also supports capacitive sensing capable of determining when two nodes are close to one another. A 1Mbps wireless network enables real-time data collection from over 25 nodes with full-state updates at 100Hz. Originally designed to transform the activity of a dance ensemble into a multi-user environment for music generation, the sensors are also being adapted to analyze the movements of professional athletes, with the potential for real-time feedback in a training environment.