

Demo Abstract: Sensor Networks for Media Production

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Categories and Subject Descriptors

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Algorithms, Management, Measurement, Documentation,
Performance, Design, Experimentation.

Keywords

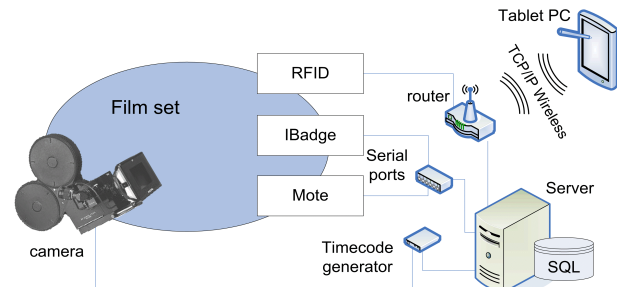
Media production, live performance, sensor network, RFID,
continuity management, control.

Emerging sensor network technologies will enhance entertainment production, providing both increased expressive capabilities and significant cost savings. The authors explore fundamental challenges of deploying sensor networks for production, concentrating here on feature film sets and networked sensing in support of on-set activity. Film sequences are captured in an order driven by economics and logistics, which often differs drastically from the order presented to an audience. Scenes captured in ‘production time’ must be visually consistent when reassembled during editing. This demo’s driver application is *continuity management*, which uses records of environmental conditions on the set to support repeatable action by the cast and crew and a consistent environment among many ‘takes’ of many ‘shots’ of many ‘scenes’. Techniques developed will ultimately also enhance the creative flexibility of directors and cinematographers by decreasing setup time and providing additional information for post-production. Given a scene, the system will record lighting equipment used, locations of lights, camera, and actors, as well as light intensity measurements, by fusing data from several different sources. All data is stored and synchronized with each video frame via an interface to a standard SMPTE time clock source on the set. The data will be available during the shoot through an 802.11b connected *tablet PC*.

1. DEMONSTRATION

This demo will show a functional system consisting of:

- **Low data-rate wireless sensor network** (Crossbow Mica2 *motes*) [1] providing distributed light intensity measurements. The sensor network will collect vital data synchronized to the film or video frame exposure in which it occurred. This post-facto synchronization capability allows later



viewing of the recorded film and its corresponding sensor data frame-by-frame.

- **Medium data-rate wireless sensor network (iBadge)** providing object position measurements. The ‘iBadge’ is a custom platform that houses multi-modal sensing, processing, and communications [2]. A network of iBadges will be responsible for tracking the camera’s position, actor location, and lights. Triangulation of 3D position is accomplished using a distributed collaborative multilateration algorithm [3].
- **RFID** providing object (prop) identification on the set. This component uses an Alien Technology RFID reader with fixed circular antenna and an Intel glove RFID reader [4]. Both readers identify passive tags attached to props and equipment; fusion with the localization system can provide object location during setup.
- **‘Kolo’ middleware** [5] managing data flow and integration of the various components, including an SQL database for persistent storage of the set’s state. Kolo is an open source Java-based distributed control system and scripting language for use by artists in entertainment applications.

As shown in the figure above, the demo will include integrated deployment in a system supporting a simple filmed scene.

2. REFERENCES

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