



1st Invitational Workshop on
Body Area Network Technology and Applications
Future Directions, Technologies, Standards and Applications
June 19-20, 2011
Worcester Polytechnic Institute

Integrated First Responder Location and Physiological Monitoring

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Performance Objectives for WPI's Integrated System

➤ Fundamental capabilities:

- 3-D location of each user relative to a chosen reference point
- Graphical display at the incident command center
- Graphical path information on all users
- Accuracy: 1m (2D) and floor level (3D)

➤ Physiological information telemetry

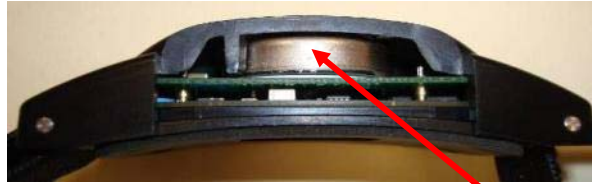
- Heart Rate
- Respiration Rate
- Oxygen Saturation Level
- Skin, and Environment Temperature
- Posture and Activity Level
- Core Body Temperature (with ingestible capsule)



Wearable Wireless Physiological Sensor



Head Band



Optical Module Disposable battery



- Flexible Configuration
- Rechargeable Battery



Streaming Measurements:



USB-Based Receiver



- SpO_2
- HR
- HRV – sympathetic/parasympathetic
- Arrhythmia detection
- Respiration rate
- Perfusion Index
- Posture
- Activity
- Skin temperature
- Motion artifact detection
- Carboxyhemoglobin ($SpCO$)
- Hydration/fluid volume loss
- Core body temperature*

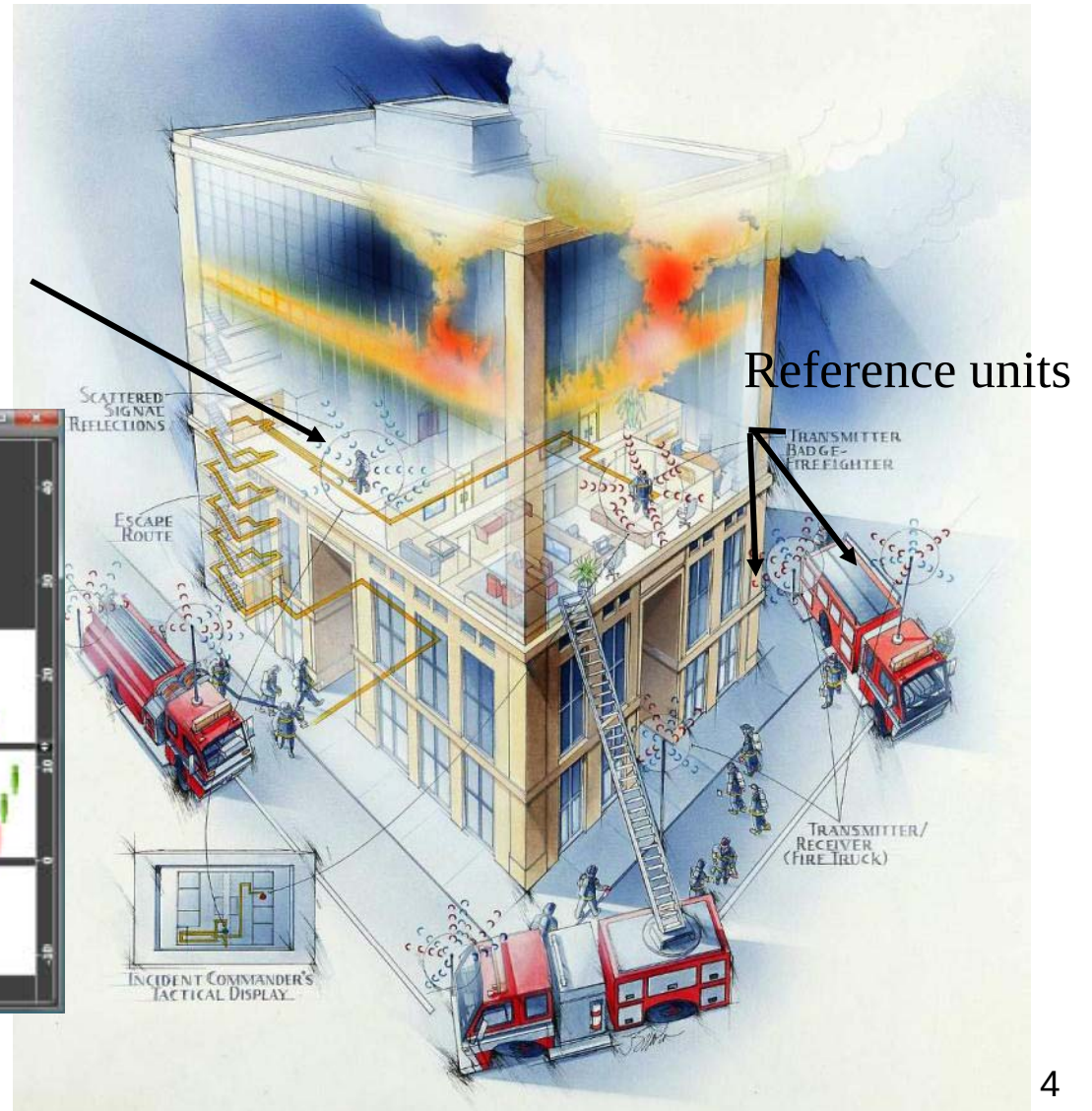
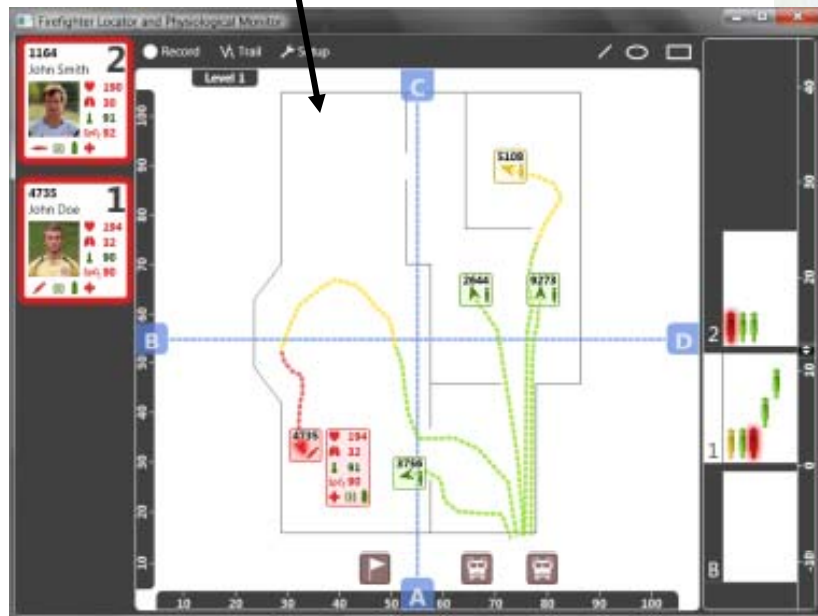
Under development



System Overview

Commander Display

Personnel Unit



2008 PPL Workshop Demo

WFD: Full CONOPs search and rescue



Five WFD teams
test five search
and rescue systems



BALSM

➤ Battlefield Automatic Life Status Monitor

- Remotely monitor physiological signs for the purpose of triage, rescue or recovery and provide a health status history over time for each member of a Special Forces team.



Development as part of QinetiQ-NA project for AFRL

August 1-2, 2011 Workshop

Precision Personnel Locator PROJECT

Precision Indoor Personnel Location and Tracking Sixth Annual International Technology Workshop

**Sponsored by Department of Homeland Security Science and Technology Directorate
WPI (Worcester Polytechnic Institute), Worcester, Massachusetts**

Overview

This Workshop provides a forum for researchers and developers working in the important area of indoor location and tracking to share technical knowledge and to define the state of the art. The focus of this workshop is on any-time, anywhere tracking of critical personnel (such as emergency responders), with extension to the breadth of commercial uses that will arise from the maturation of this technology. Further, the focus is on systems that provide complete tracking and position information on all equipped personnel. This year's workshop will also include consideration of the applicability of commercial location-aware systems to the needs of the first responder community. The important topic of standards development for location and tracking systems will also be addressed, as will integration with other sensor technologies that benefit from location awareness.

Materials

- [Workshop Announcement](#)
- [Request to Participate Form](#)
- Agenda TBD

Acknowledgments

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- WFD and MA Firefighting Academy
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 - Jim Duckworth, rjduck@wpi.edu

www.ece.wpi.edu/Research/PPL/

