

# Vision

- FireEye head-mounted display (HMD) goals
  - Abstracted local area floor plan Fire locations
    - Company personnel locations
  - Critical messages
    - Text messages from Incident Command (IC)
    - SCBA remaining air
- Electronic Incident Command System (eICS) goals
  - Personnel communication, location and health status
  - Resource allocation and management
  - Fire/Smoke/CO/Temperature information
- SmokeNet goals
  - Wireless Sensor Network (WSN) using **Telos Sky platform**
  - Information and communication backbone for FireEye and eICS
  - Provides room-accurate location of fire personnel

**Methods** 

fatigue

image

Minimized eyestrain and

•Eve does not re-

Downward glance

extreme vergence

+/- 3 diopter range of focus

accommodate to a closer

positioning (vs. upward)

reduces fatigue during



SmokeNet

- FireEye usability
  - Side-to-side and up-down positioning with ball joint Aspheric lens
    - Minimized aberrations •20° field of view and 5 cm eve relief
- PC104 prototype wearable computer
  - Small ~5"x5"x3.5" form factor, 650 MHz CPU, 512 MB RAM Windows XPe (embedded)
  - Controls FireEye GUI
  - Stores floor plan and
  - SmokeNet information
  - Powers SmokeNet firefighter localization mote
- Practical
  - Mounted to SCBA backpack No interference with air tank for quick tank changes
- Cooling heat exchanger in air line using tank pressure drop Not yet fireproof: final version must be smaller and better protected











### Research Questions



Informal usability testing and interviews with firefighters

- Low fidelity prototypes
- •Flash MX and paper prototypes Graphical user interface (GUI)

### frame of reference: ego or exo?

- Egocentric: map rotates around user; user always points forward Performed more efficiently in army experiments [1]
- Exocentric: map orientation remains fixed
- More effective for IC view
- No clear favorite
- Integrate option of either one

## Findings

#### Prioritization of GUI visual elements

- Used rate and rank questionnaire





- Nearest exits
- Location of company
- Messages from IC Where user has been

Center for Information Technology Research in the Interest of Society













 Must prioritize info during firefighter interviews