Visual Analytics for Command & Control

Creating Actionable, Relevant Information from Multisource, Evolving Data

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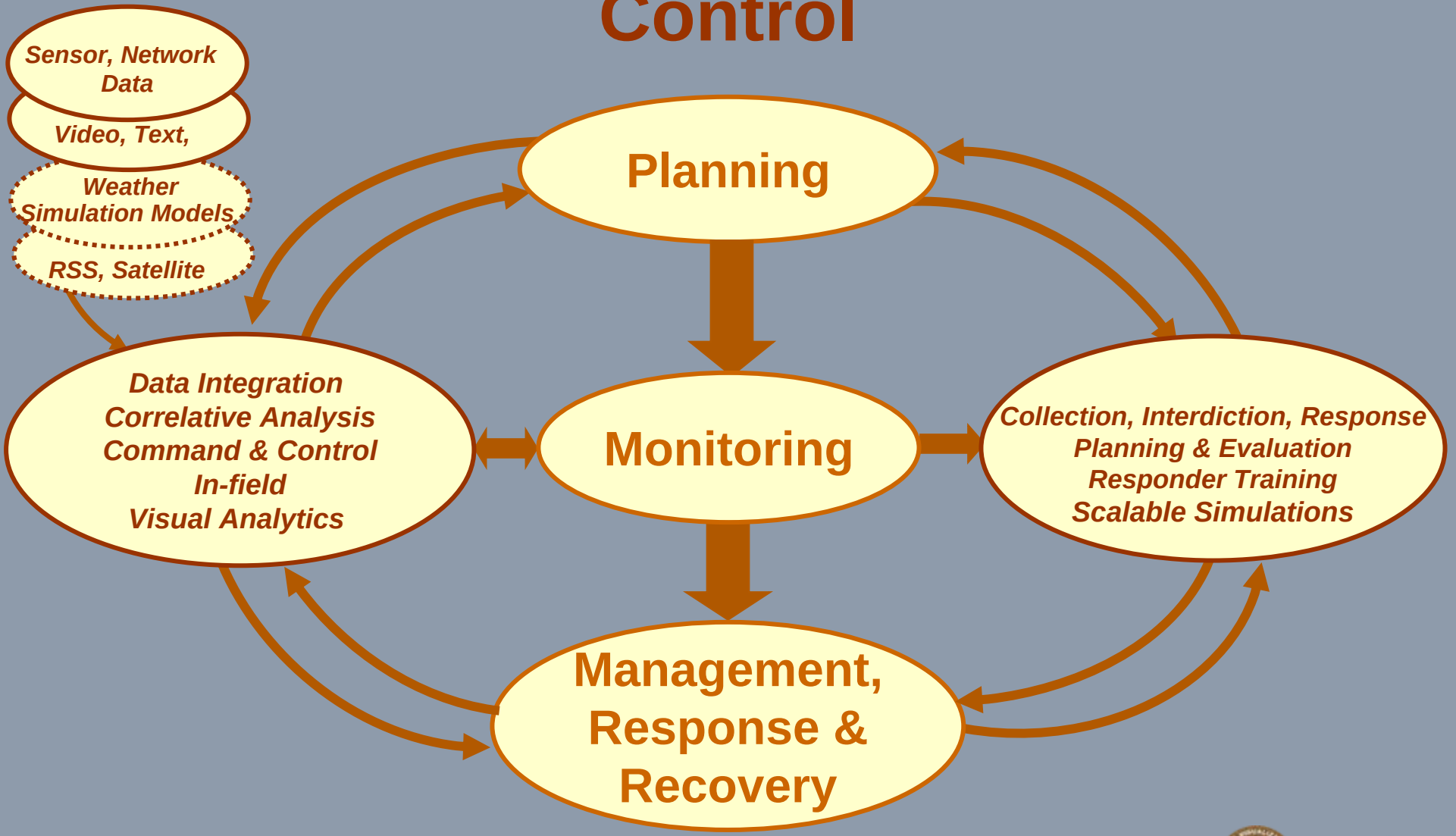
Visual Analytics for Command and Control



Command and Control Visual Analytics

Goal: Provide informat

Keys to succes

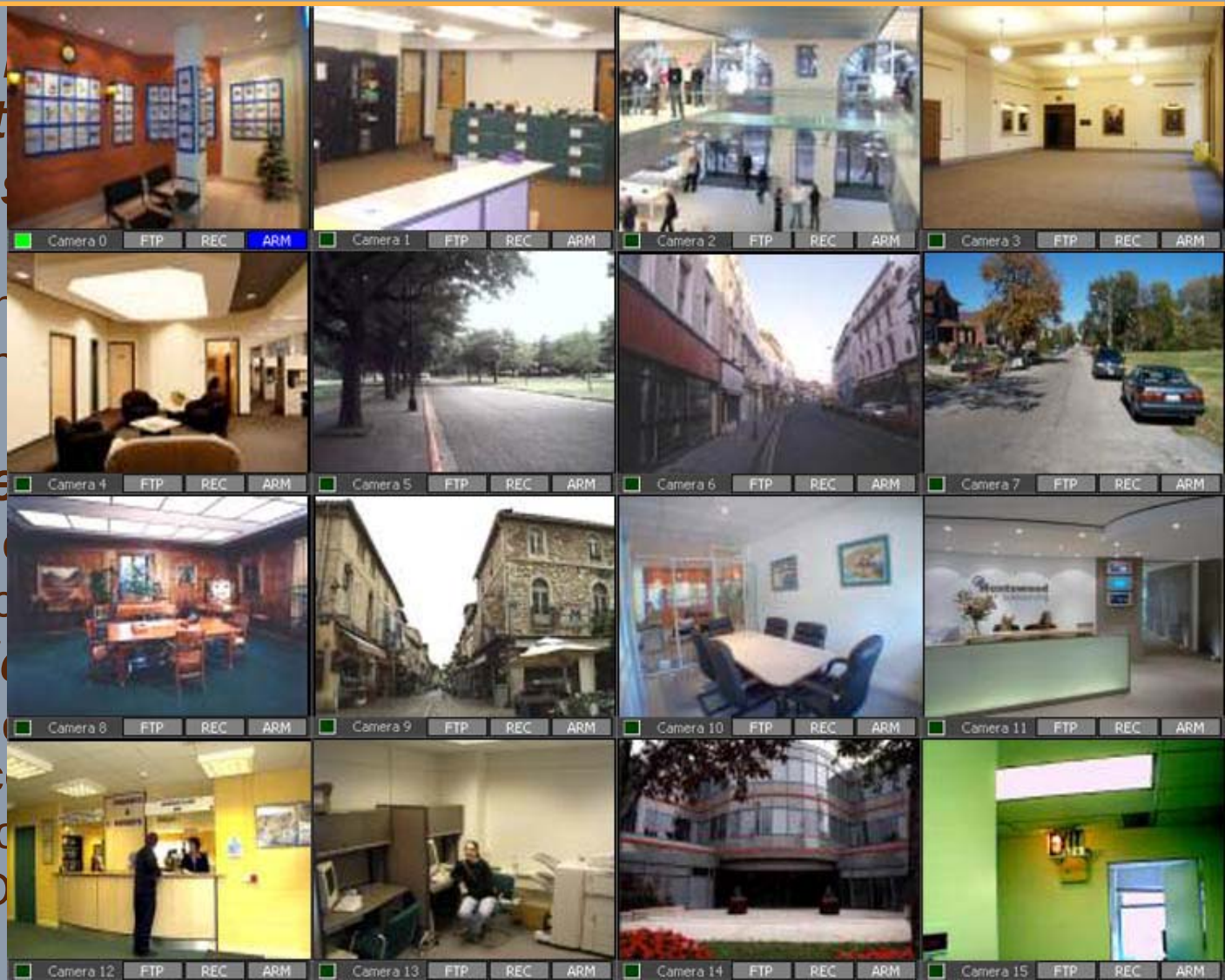
- Usability
- Appropriater
- Reliability ar
- Security

Unique require

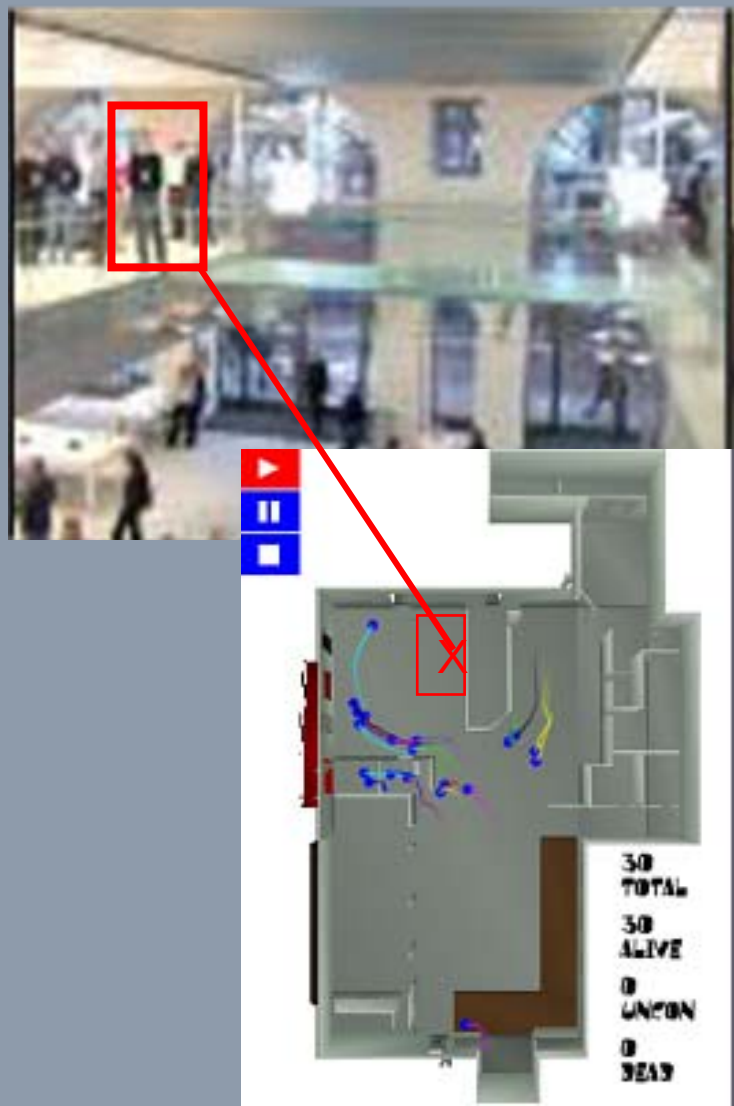
- Display/devi
- Seamless sc

Example appli

- Command c operations c
- In-field respc
- Scalable CO

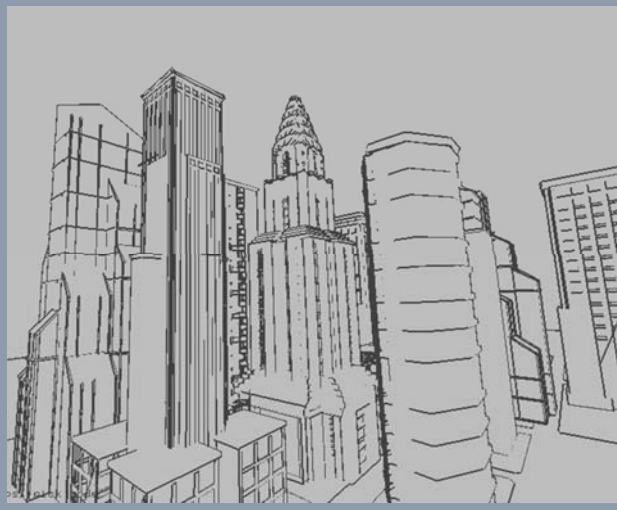


Command and Control Visual Analytics Solutions



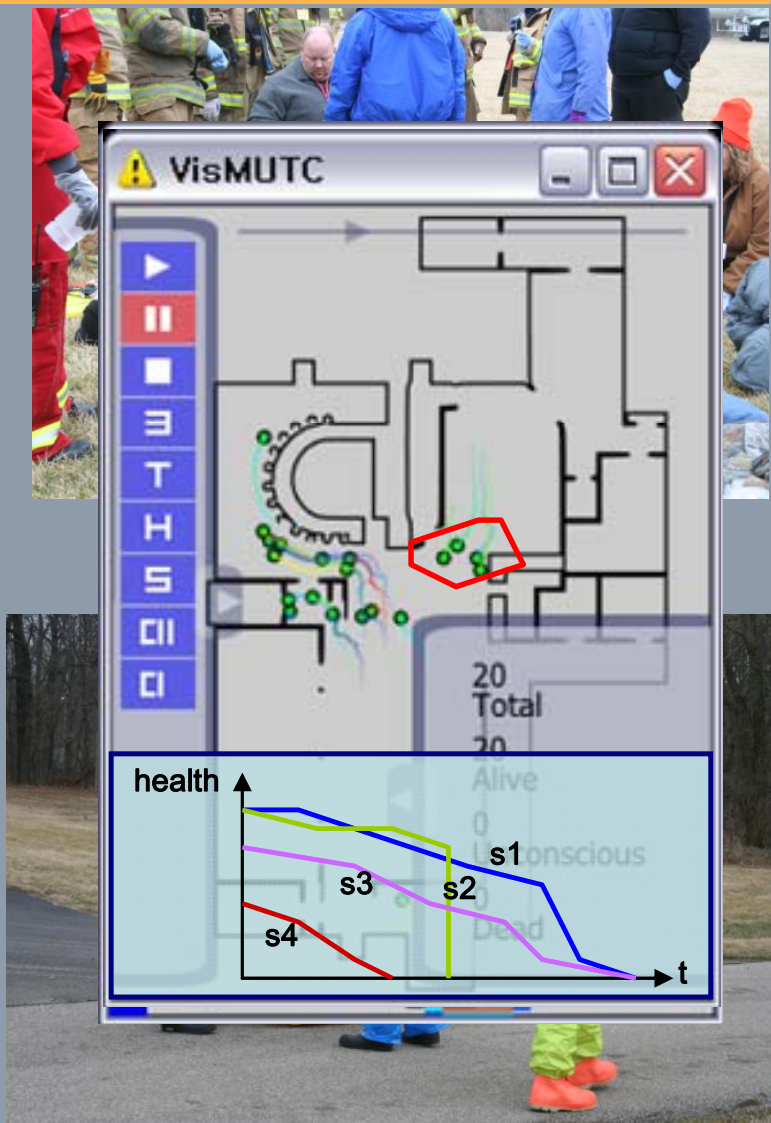
Mobile Visual Analytics: Research Issues

- *What information is needed for decision making and action?*
- *What rate of update (e.g., avoid paralysis by analysis)?*
- *How to create appropriate visual representation/abstraction of this information?*
- *How do you adjust algorithms to enable on-device mobile analytics?*
- *How do you balance local-remote distribution of work?*



Command and Control Visual Analytics: Solution Approach

- *Understand the user, their task, and the task environment*
- *Perform cognitive analysis of task*
- *Abstract data deluge to relevant information for decision making*
- *Utilize simplified, abstracted, task-adapted representation to enable more effective realtime decision making*
- *Continuously refine with real users and real-world scenarios*



Command and Control Visual Analytics: Solutions Examples

Scalable Common Operation Picture / Situational Awareness

- Utilize the Muscatatuck Urban Training Center, local police, former school

In-field investigation

- Social networks
- Real-time response
- Investigative phase

Mobile video/image analysis

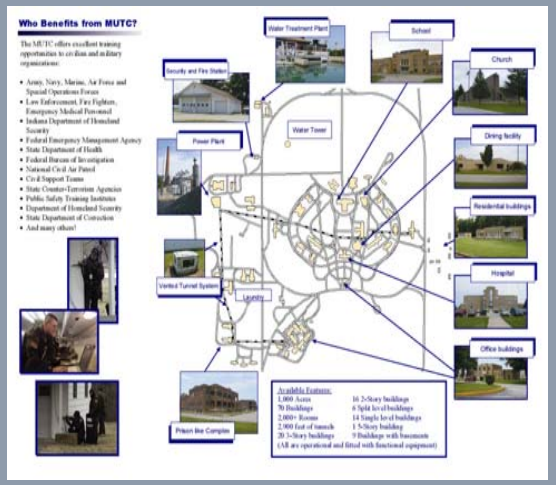
Muscatatuck Urban Training Center Mobile and EOC Visual Analytics

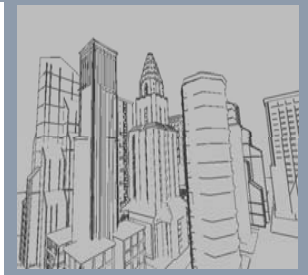
Goal

Demonstrate a mobile, low-cost exercise monitoring system

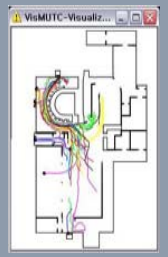
Solution approach

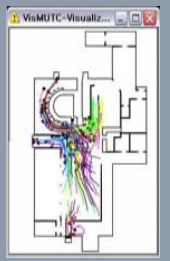
- Provide increased EOC and in-field situational awareness through integrated visual analytics
- Track, display, and interact with actions and events during and after training exercises
  - Track up to 25 exercise participants responding to and within a scenario building
- Provide a national capability to train, test & experiment with joint, interagency, inter-government, multi-national teams



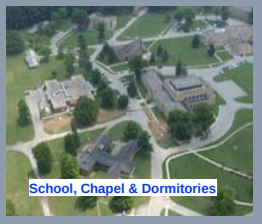


Varying PDA rendering style for device characteristics and to highlight information





PDA view of personnel tracking in a fire simulation.



Components

Personnel/asset tracking

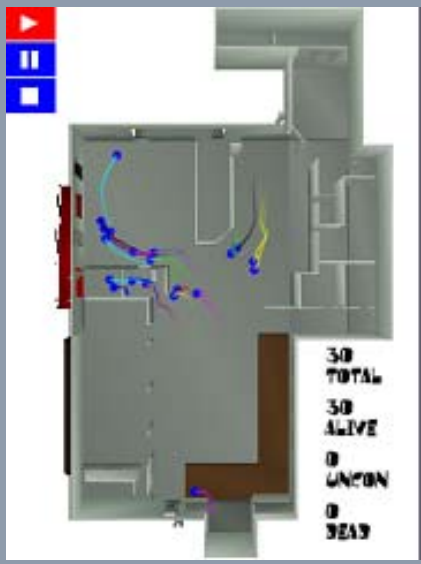
- Interior and exterior tracking, sensors

Video/audio recording & monitoring

- Streaming and recorded

COP and AAR displays

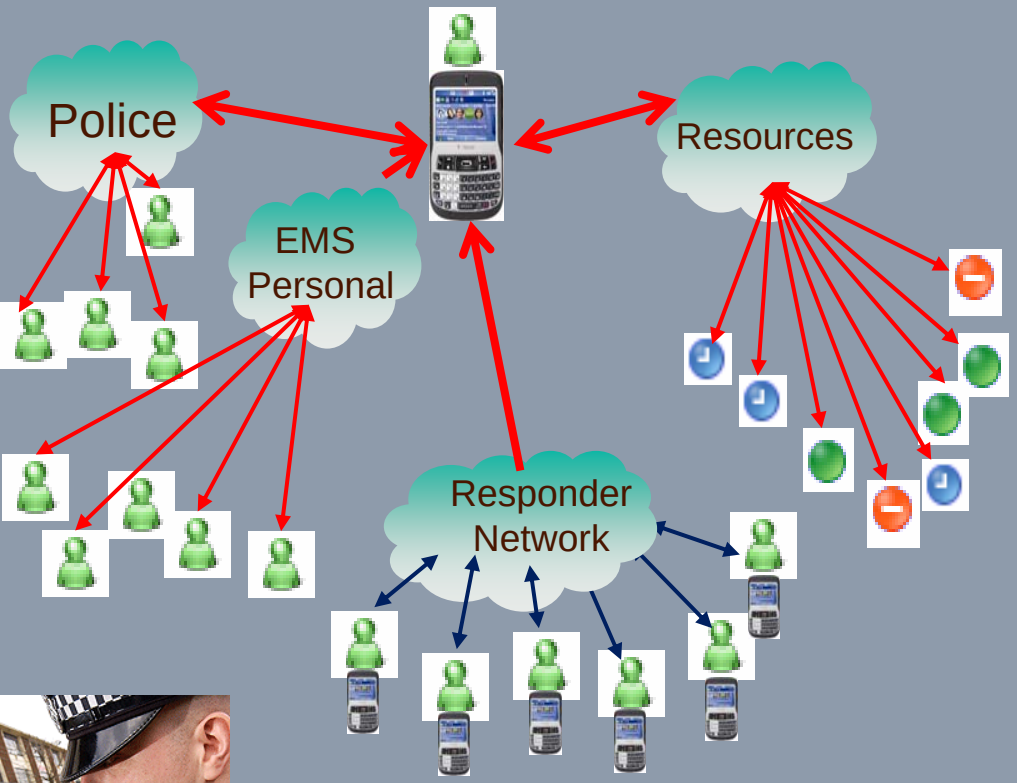
- Integrated tracking and video display for situational awareness and review



Real-time data, video, sensor, communications, and network integration

Social Network Information for First Responder Scenarios

• How do you coordinate resources, and First Responders in an emergency?



• By leveraging social network principles we can improve coordination among responders.

• This approach will enable multiple groups to work and share information/resources in a more efficient manner.

Partners with Edward J. Delp, Deen King-Smith – VIPER Lab

Mobile Image/Video Analytics

Goal

- Image and video analysis on a mobile phone with a camera
- Content-based organization and summarization
- Augmentation with web-based information retrieval

Requirements

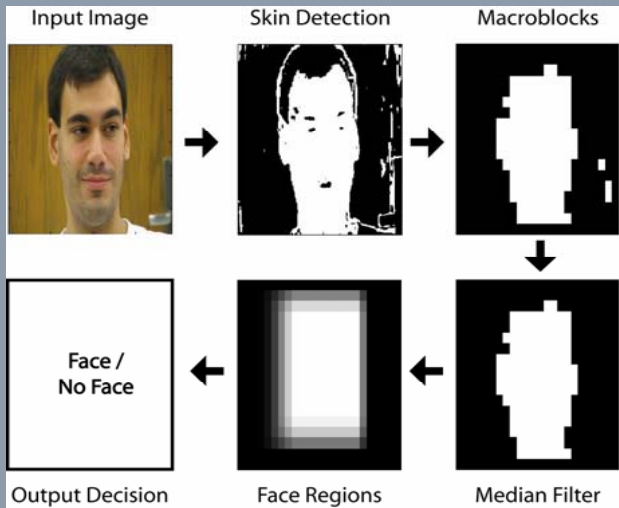
- 1-2 seconds processing
- 80% accuracy

Example questions

- Indoor/outdoor
- Motion / no motion
- How many faces?

Use

- Border security, surveillance, location-based information retrieval



Acknowledgments

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