USU AFRL MATES

Mobile Active Threat Emergency System

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Problem Statement

First Responder Active Threat Support System

- Locate and identify individuals
- Magnify effectiveness of trained professionals
- Connect existing and future systems
- Locate “hide-in-place” individuals
- Adaptable to multiple emergency situations:
  - Natural Disaster
  - Active Threat
  - Search and Rescue

SME Introduction

- Captain Tyson Budge – Logan City Police
- Cole Smith – President of Tresit Group
- Captain Harris – USU Police
- Sergeant Dunn – USU Police, S.W.A.T.
- Corporal Harvey – US Marine Corp. Marksman
- Will Lusk – Emergency Manager
- Stephen Parker – Tuscon S.W.A.T. Instructor
- "John Doe" – Las Vegas Medical First Responder

System Requirements

SME requested system features:

- Assist and enhance current First Responders
- Lightweight and hands-free
- Enhance communication among First Responders
- Identify and report location of personnel
- Distribute information to Responders
- Integrate easily into existing First Responder equipment

SME Feedback Avoidances

SME requested system features:

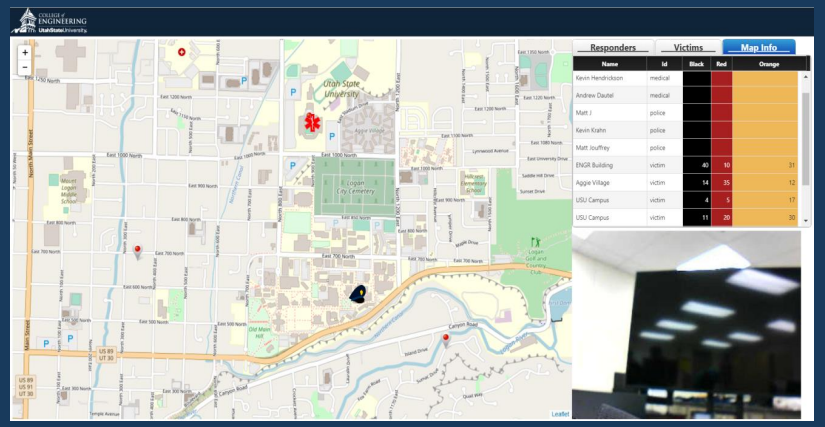
- DO NOT replace trained professionals
- No special tools
  - Ineffective
    - Improper Search and Seizure
    - Training
    - High Costs

LEGION

Linked Emergency Gear Inter-Operative Network

System Overview

Location
Video Stream



Location
Victim Data

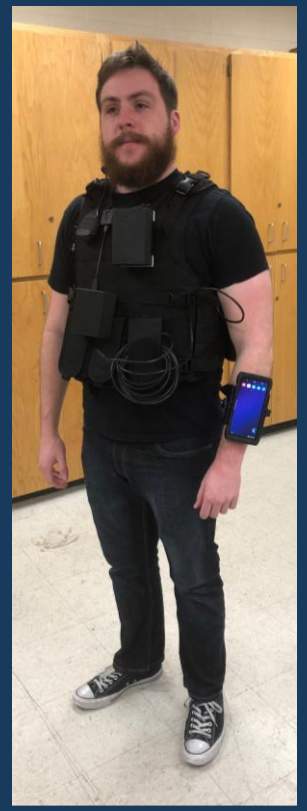
Map
Video

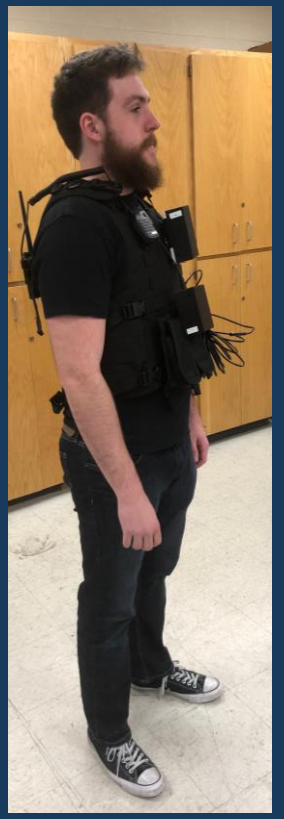
Map
Victim Data

Physical Devices

Physical Devices

- Forearm mounted cellphone
- Body camera
- Borescope
- Thermal camera
- MiFi router
- Battery





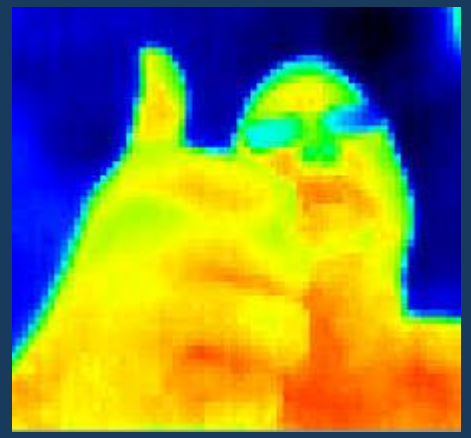
Smart Phone w/ Forearm Mount

- Durable Case
- Ambidextrous
- Rapid/Secure attachment
- Samsung S9
  - Flexible OS
  - OTS screen & battery
  - SME approved

FLIR Thermal Cam

- Requested:
  - Logan Police
  - USU Police
  - Cpl. Harvey

- Useful for low-visibility environments
- Locate hide-in-place individuals



Depstech Borescope

- Requested:
  - Cpl. Harvey
  - Capt. Budge

- Assist Contact Team
  - View through tight spaces
  - View around corners

Body Camera

- Commercial body camera (Future Goal)
- Raspberry pi 3b+ w/ pi camera

Power Supply

AA Battery pack with UBEC

- Requested:
  - Cpl. Harvey
  - Capt. Budge

- Batteries can be replaced in the field
- Provides 3+ hours of device life
- Used in existing responder devices

Device Connection

Verizon MiFi 8800L

- Currently in use by Logan City
- Small size/weight
- Personal WiFi signal
- Internal battery
- Basic network security

Cradlepoint ibr900

- Ruggedized
- Designed for First Responders
- Up to 128 connected devices
- Unified edge security including multi-zone firewalls, IDS/IPS & internet security
- Central Command internet connection

ThingWorx

ThingWorx Security

- Role – based access controls
- Encrypted WebSocket channels
  - Adheres to protocol RFC 6455
- Secure data centers
- Multilevel authentication between the cloud and edge devices

App Info and GUI displays

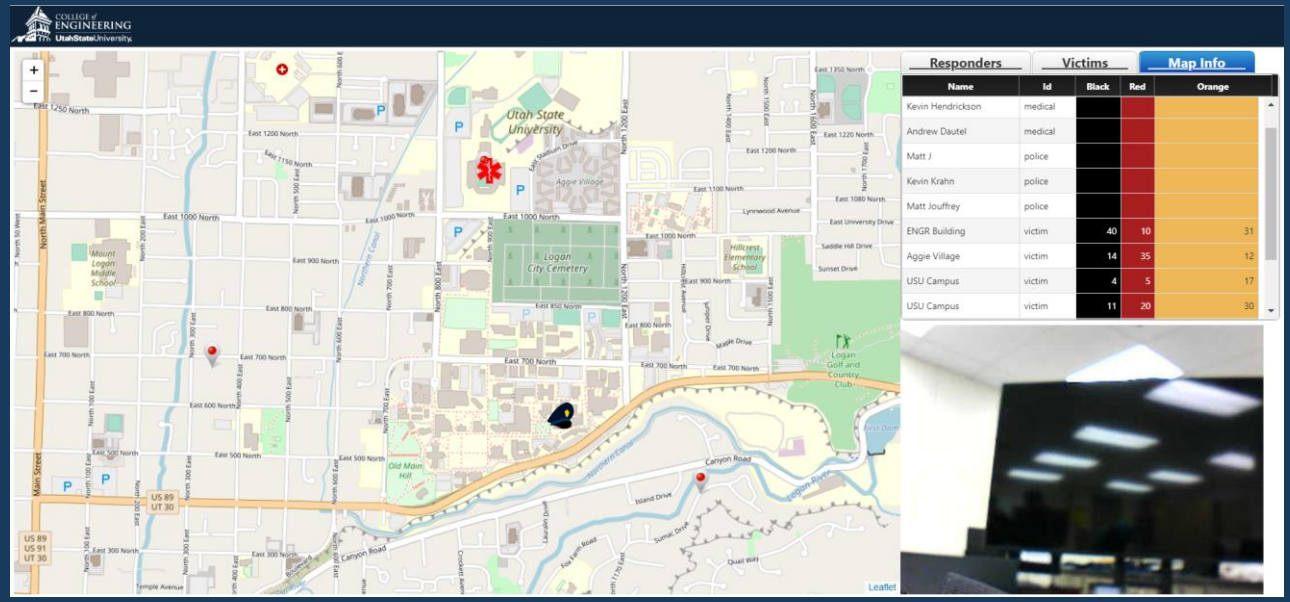
Three Separate Interfaces:

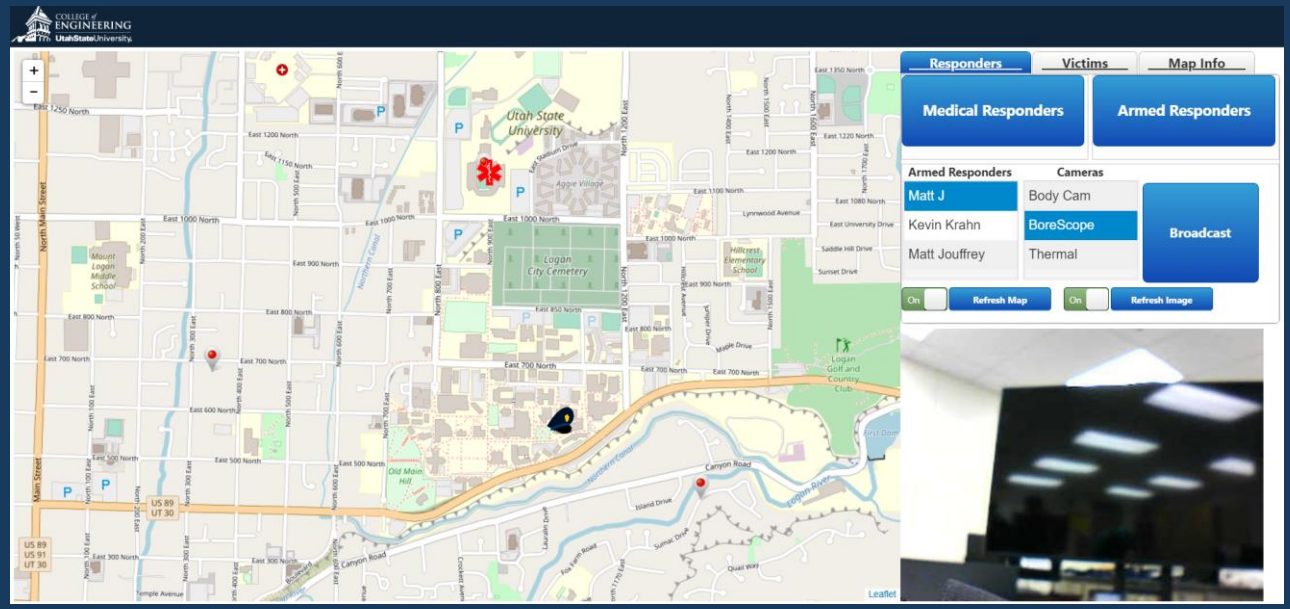
- Command – View situation and disseminate information
- Unarmed Personnel – Identify victims and locations
- Armed Personnel – View map and share video streams

Central Command

- Map displays location of responders and victims
- Select a location to highlight map pin
- Triage victim count at location

- List team personnel information
- Select each camera feed
- Broadcast special camera feed to team





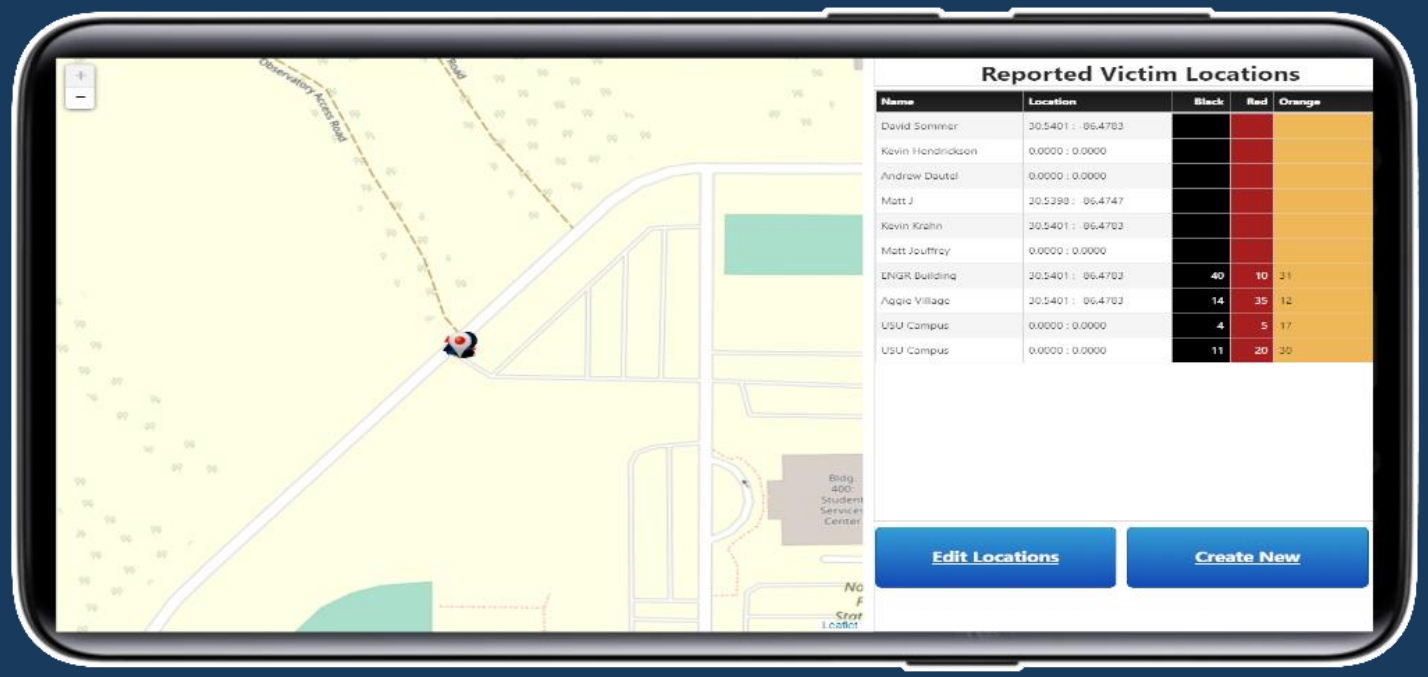
Unarmed Responder-Home

- Map on left of screen

  displays victim locations

- Select locations of victims

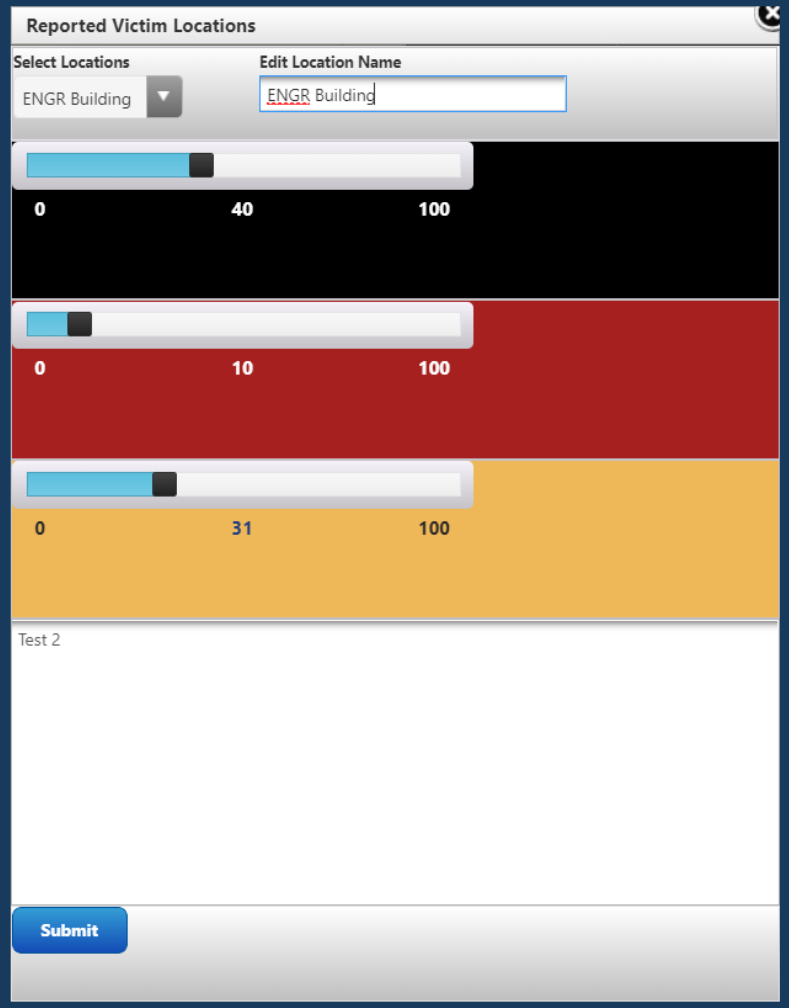
- Add new victim location



Add/Edit Victim Locations

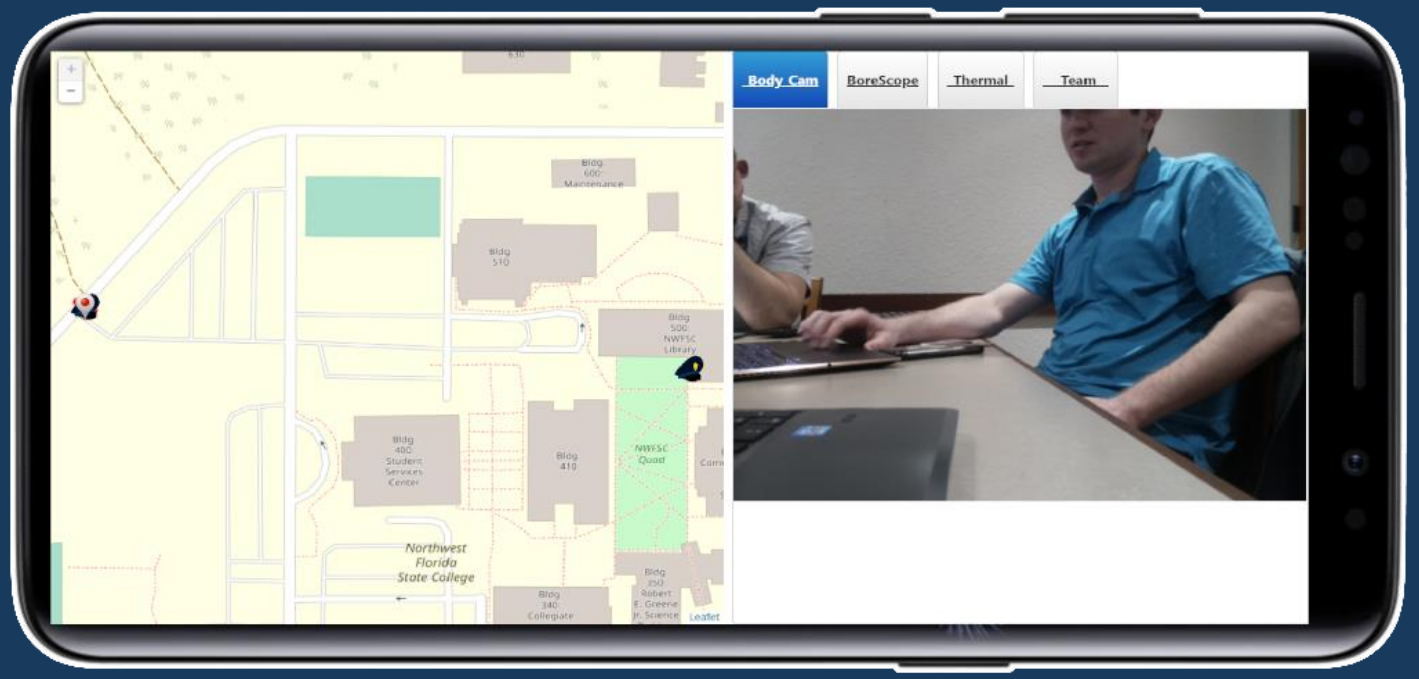
Command Central and Medical Responders

- Text box to name location
- Sliders to count victims by Triage status
- Add number of victims
- Text box to add comments



Armed Responder-Home

- Map displaying personnel locations
- Right screen shows selected camera feed
- Minimalistic design elements



Future Developments

Dynamic Google Maps Overlays

- Dynamically update cleared rooms
- Provides headquarters with visual progression of event
- Useful for post-event medical efforts
- Geofence areas of interest

Real-time Social Media Data Import

- Search social media posts for keywords
- Increases first responders' data sources
- Increases situational awareness from victims' perspective
- Contact affected people

Increasing Sensor Options

- Professionally manufactured sensors
- Robot/Drone integration
- Additional data collection sensors
  - Air Quality Sensor
  - Radio Frequency Human Detection Sensor