

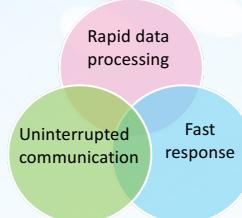
Rapid and Resilient Critical Data Sourcing for Public Safety and Emergency Response

Eyüphan Bulut(VCU), Milos Manic(VCU), Murat Yuksel (UCF)

1 MOTIVATION

- Crowd-sourcing based apps have the potential to trigger collection of vast amount of critical data for public safety.
- In emergency scenarios (i) communication network could be congested or damaged, (ii) huge tile-wave like submissions of eyewitness data from crowd may crash agency systems (e.g., Boston marathon incident) and (iii) near-real-time and agile analysis of the massive amount of time-sensitive data could save people's lives.

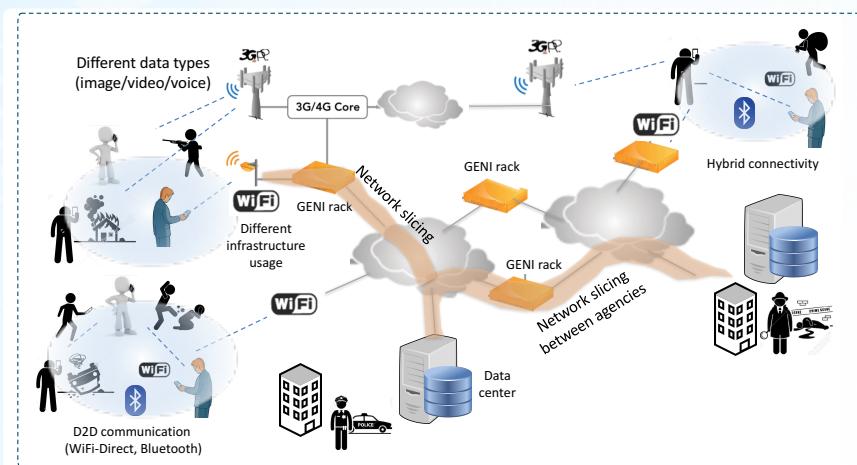
2 CHALLENGES



3 PROPOSED SYSTEM ARCHITECTURE

The proposed **emergency response platform** consists of the following components:

- WiFi augmented GENI network access
- GENI slicing enhanced emergency communication with dedicated bandwidth
- D2D based multi-hop communication in case of cellular network failures
- Smartphone app for end-users to submit eyewitness data
- Cloud platform (e.g., NSF CloudLab) connected to GENI to store data
- Near-real-time analysis for critical feature extraction (e.g., faces of criminals)



A Cloud Integration

Cloud integrated Critical Data Sourcing and Management

- Mobile app development for crowd sourcing based eyewitness data collection
- Minimizing overhead on user's data plan
- User-level vs. kernel-level design
- Data storage
- Near-real-time face extraction

CloudLab



C GENI for Wide Area Resilience

GENI Integration for Wide Area Resilience

- Augmenting GENI with wireless
- GENI-based SDN testbed
- Network slicing for emergency communication

