Collaborative Research: Data Mining and Fusion between Unmanned Aerial Systems and Social Media Technologies to Improve Emergency Operations

Anand Puppala, PhD, PE, Fellow-ASCE, D.GE, A.P. and Florence Wiley Chair Professor, Texas A&M University
Navid H. Jafari, PhD, Assistant Professor, Louisiana State University
Nina Lam, PhD, Abraham Distinguished Professor, Louisiana State University
Surya Sarat Chandra Congress, Associate Research Scientist, Texas A&M University

Introduction

- ❑ Emergency operation centers (EOCs) are tasked to **rapidly** and **accurately** collect and process data in order to make informed decisions to concerned agencies and stakeholders during natural hazards.
- ❑ A fusion of innovative technologies is envisioned to help EOCs **efficiently** conduct tasks during natural disasters.

Research Need

- ❑ Evidence from the EOC in Beaumont, TX post Harvey indicates that UAV technology and social medial will play an increasing role in quantifying infrastructure and community resilience.
- ❑ Key remaining challenge for EOCs is documenting the current operational inefficiencies, technology gaps, and data analysis limitations of EOCs.

Research Components

- ❑ Survey infrastructure response in Coastal Louisiana – Pre and Post Hurricane Barry.
- ❑ Interviewing EOC officials on disaster operations.
- ❑ Data mining of UAVs and social medial Twitter posts.
- ❑ Data management and fusion of hazard level, community infrastructure damage, technology, and EOC operations.
- ❑ Synthesis of technology adoption across Hurricanes Barry and Harvey and affected regions (Texas, Louisiana).
- ❑ Integration and advancement of knowledge gained to EOCs.

Scientific impact:

- ❑ Identify CPS research roadmap on how to mine, integrate, and disseminate information from UAVs, social media, and other technological platforms for EOCs to make informed decisions and quickly bring communities and cities back to normalcy.

Broader Impact on Society

- ❑ Disseminate information to save lives and limit misinformation.
- ❑ Facilitate community resilience by allowing quick damage assessments and recovery claims.

Education and Outreach

- ❑ E&O will involve doctoral and post-doctoral fellows and workforce training.
- ❑ The knowledge gained will be transferred to EOCs in Texas and Louisiana through a technical guideline and short courses.

Potential Impact

- ❑ Search and rescue (SAR) – Technological leap
- ❑ Real-time disaster data, e.g., dynamic monitoring & planning, damage estimation.
- ❑ Post disaster recovery plans, e.g., better preparedness, targeted response.

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