Leveraging Smart Technologies and Managing Community Resilience through Networked Communities and Cross-Sector Partnerships

NSF Project: 1952792

Yue 'Gurt' Ge, University of Central Florida

IRG-2, FY2020

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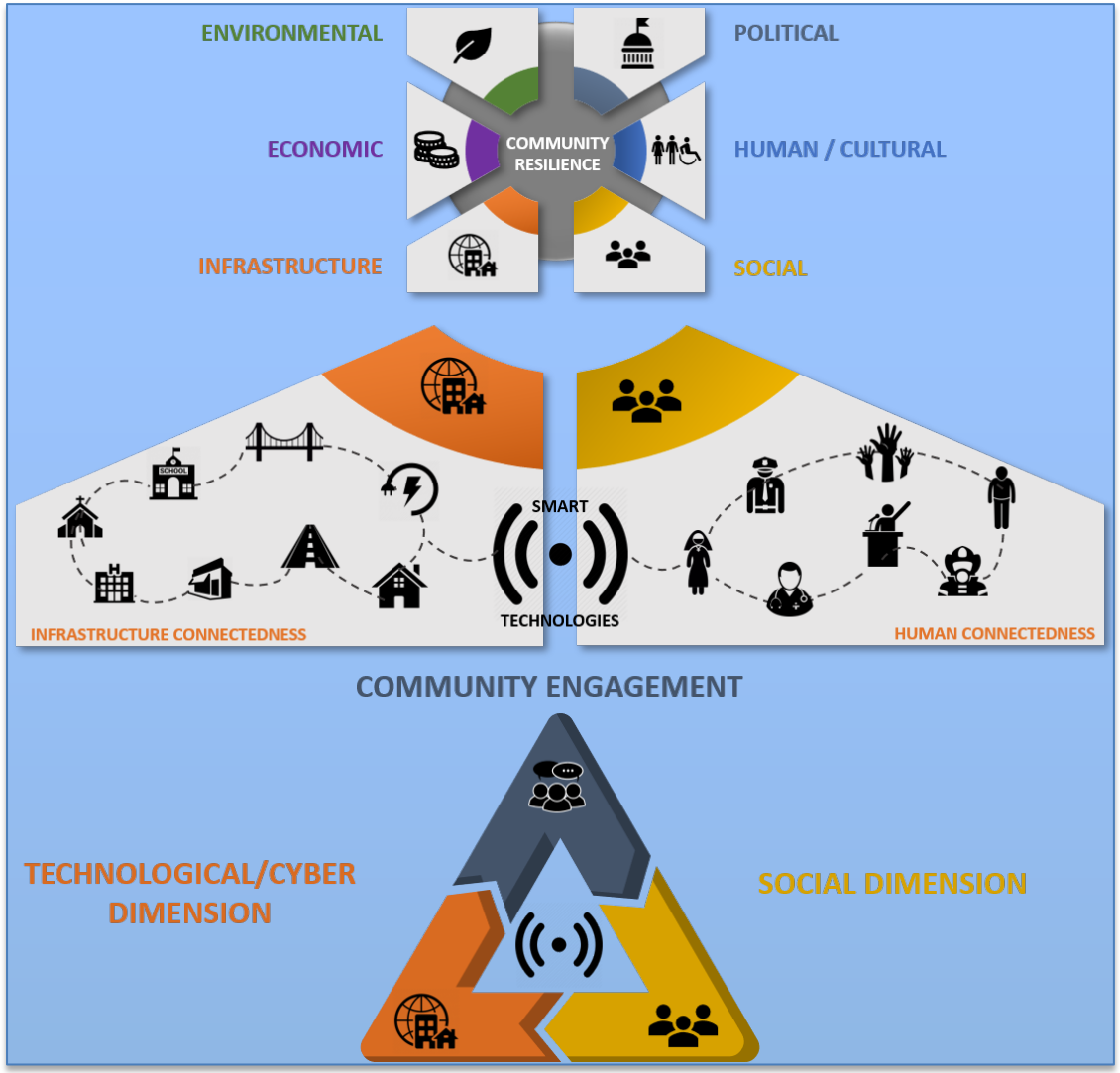
Project Overview

Visual Schematic



Project Vision

- **Leveraging** existing community partnerships and resources in communicating risks of emergencies and disasters.
- **Evaluating** the information technology (IT) applications aided by artificial intelligence (AI) and cross-sector partnerships in enhancing community resilience management.

Project Overview

Use-Inspired Research

- The project seeks to address the issues of **incomplete and ineffective information sharing** related to risks and vulnerabilities during a disaster situation, and the effects that **the lack of information has on public-private partnerships (PPPs)** to build more resilient communities.
- The **east central Florida (ECF) region** (including 8 counties and 78 member towns/cities) is the testbed to apply the scientific design from this project to community resilience practices.

Fundamental Research Contributions

- Filling research gaps in **modeling community partnership** characteristics and **examining design and implementation networks** among cross-sector partners for community resilience efforts.
- Creating a holistic approach to **comparing community resilience functionality changes** by research intervention and an actual hazard event.
- Building *Community Resilience Data Depot* (CoRD^2) for **resilience data sharing and integration** among sectors to support **real-time collective decision making**.

Project Update

- ***Emergency Managers/Operators Web Survey.*** Conducting literature review, designing the web survey questionnaire, and preparing for an IRB application.
- ***Resilience Policy and Plan Analysis.*** Collecting resilience policy and planning documents at the federal, state, and county levels for content analyses based on several federal frameworks.
- ***CoRD^2- Land Overlaid on Transportation Information System (LOTIS).*** Having meetings with community partners for creating plans to develop the CoRD^2 (Community Resilience Data Depot) website based on the existing geocoded resilient data at the county and municipality levels in the ECF region and the integration of LOTIS into the CoRD^2 data depository.
- ***3-1-1 Data Analysis (newly proposed subproject).*** Collecting 3-1-1 data to analyze residents' behavior in response to non-emergency events in the Orlando metropolitan area before and during the COVID-19 pandemic and hurricane seasons.
- ***Project Progress and Community Engagement Evaluation.*** Documenting monthly whole-team and smaller group meetings, work plans and outcomes for subprojects, and community outreach activities.

Project Evolution

- We learned that the LOTIS data base has integrated historic land use and transportation data from three ECF counties on safety, proximity, government services, etc., but the data are static and aggregated. Thus, the team is partnering with City of Orlando and East Central Florida Regional Planning Council (ECFRPC) and planning on developing a cloud-based GIS tool in CoRD^2 for public managers to report emergencies on smart phones in a real-time fashion and better inform a collective decision making on reducing risks to the affected communities.

- We learned that in ECF the ECFRPC and its affiliated counites are currently undertaking regional and local resilience assessments, but there seemed a lack of synergistic efforts to evaluate the resilience policies and plans across all the ECF counties and in the Greater Orlando area. As a result, we have been collecting resilience-relevant polices and plans in the ECF region from government and NGOs and working on a comprehensive analysis of community resilience improvements.

Anticipated Outcomes & Success Measures for Year 2

- Distributing a web survey among emergency managers and operators across sectors in the ECF region; focusing on the Florida Emergency Preparedness Association (FEPA) members to assess contributions of PPPs and advanced IT to risk communication and community resilience.

- Conducting cross-sectoral social network analyses on collected resilience plans and policies.

- Creating the CoRD^2 website to store, retrieve, and share resilience data among all sectors; integrating some features of the LOTIS into CoRD^2 to develop an app for smartphones for processing simulated or real-time disaster response data.

- Analyzing the longitudinal 3-1-1 data in response to a certain event, such as COVID-19 and a hurricane, in the ECF region to determine the resilience level of communities.

- Conducting an in-house simulated drill at the FEPA annual conference with pre-/post- surveys with emergency managers and operators to test IT applications in enhancing real-time risk communication.

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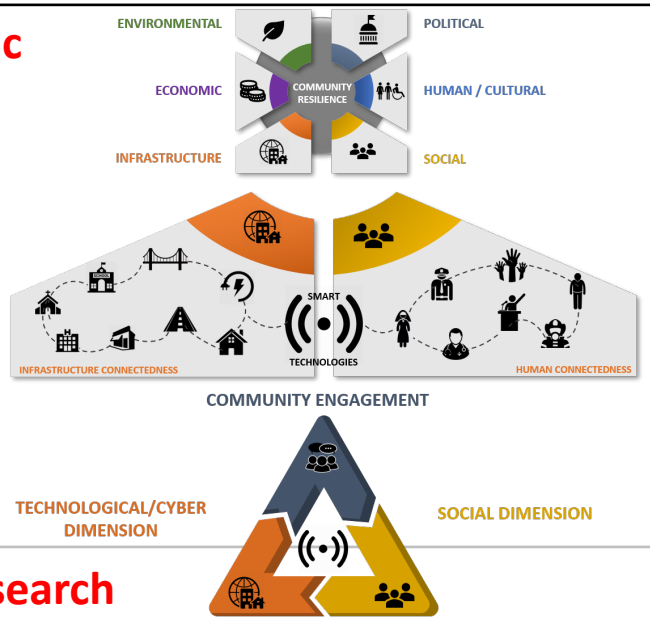

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