17TH INTERNATIONAL CONFERENCE ON INFORMATION SYSTEMS FOR CRISIS RESPONSE AND MANAGEMENT

POSTER/DEMO PROPOSAL

17th International Conference on Information Systems for Crisis Response and Management

"Bringing Disaster Resilience into Focus"

Workshops and Doctoral Symposium - May 24th, 2020

Main Conference - May 25th-27th, 2020

Blacksburg, Virginia USA

Virginia Tech

http://www.drrm.fralin.vt.edu/iscram2020/

Program Committee co-chairs:

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TITLE

Hurricane Irma: Multiple avenues of study

INTRODUCTION

Provide a brief description of the context of the poster/demo. For example, is it dedicated to presenting PhD research work, a funded collaborative project, the contributions of a research team, etc. Around 250-350 words or 10 lines of such description should be provided.

The CRISP Type 2: Coordinated, Behaviorally-Aware Recovery for Transportation and Power Disruptions (CBAR-tpd) project addresses the question: "how can we better recover from infrastructure disruptions by using a coordinated approach that accounts for human behavior?" [1]

Our overarching goal is to develop power and transportation infrastructure recovery strategies that incorporate the processing of information by individuals, anticipate behavioral adaptation in response to this information to better align infrastructure priorities with user needs, and more quickly return households to productivity.

Through this poster, we describe the steps towards building a better understanding of adaptation and general behavior during the disruption caused by a hurricane. Our investigation begins with analyzing data streams from social media and surveys. We summarize our efforts to understand and compare information collected in South Florida: from tweets during Hurricane Irma, from an online survey of South Florida residents about Hurricane Irma nine months later, and from damage claims filed by policyholders in the National Flood Insurance Program. Our analysis focuses on understanding how people report outages and restoration throughout the pre-, during-, and post-evacuation periods.

More specifically, we try to understand how people reported outage and restoration using Twitter. For example, after data pre-processing, analysis, and advanced analytics, we were able to construct a time series that showcases the volume of conversation about outage and restoration during the hurricane period (see Figure 1 below).

We also present results from a choice survey conducted on 1341 Florida residents nine months after Hurricane Irma. An example of the findings is that residents prioritize recovery of power followed by re-opening of work, followed by reopening of grocery stores, roads, transit, and schools.

Our poster will similarly showcase all Twitter and survey analyses on Hurricane Irma that are a part of the project's investigations into responses during hurricanes.

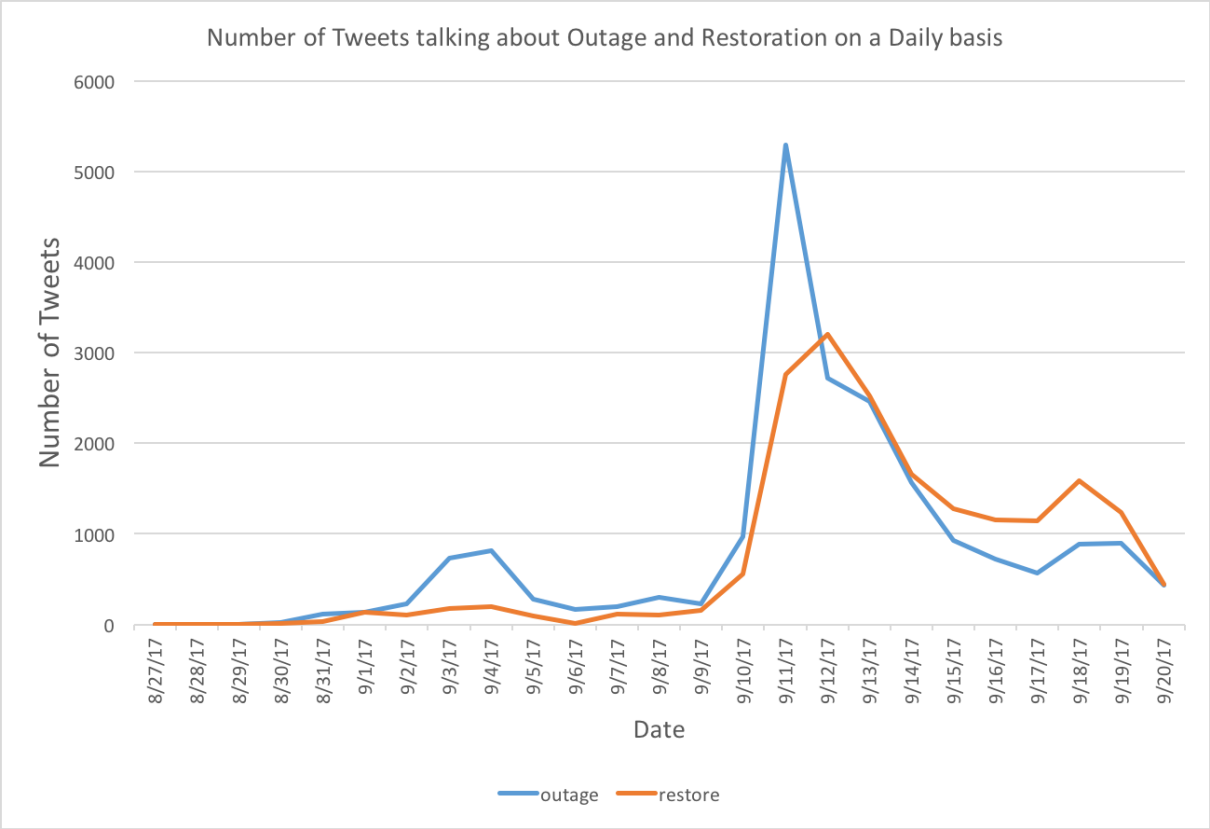

Figure: Tweet quantity initially detailing outages, and later, restoration

Please mark if this is a: Poster Submission [X] or a Demonstration submission [ ]

POSTER SUBJECT (if applicable)

Provide an abstract of the content of the poster. If possible, please include the broader implications of the project.

We explain how households and institutional actors adapt their activity-related behavior in the face of transportation, power, and joint transportation-power disruptions. We describe methods for collecting and analyzing tweets, integrated with data collected from surveys, in support of understanding power, transportation, and human behavior connected with disruptions. We detail how outage and restoration are reported by individuals. We report on our observations, supported by the data collected, guided by project aims.

PRESENTER INFORMATION

Describe the previous experience of the poster / demonstration presenter(s) at ISCRAM or related meetings, and any other qualifications for this responsibility, such as recent papers on the topic being proposed. In addition, you should note which presenter plans to be at the conference. Multiple authors are permitted, but at least one member of your team must register for the conference and attend as a presenter.

Prashant Chandrasekar is a Ph.D. candidate at Virginia Tech Computer Science department. In the past, he has worked as a GRA for the GETAR project, and the CRISP-funded project. His activities include data collection and text mining.

Kris Wernstedt is a Professor in Virginia Tech's School of Public and International Affairs. His work spans numerous topical areas in environment decision making, which includes: urban infrastructure, water management, among others. Almost all his work intersects one or more risk constructs including actuarial approaches (environmental insurance) and cultural theories of risk (grid-group analysis), with probabilistic, economic, and psychometric treatments in between.

Edward A. Fox received his Ph.D. from Cornell in 1983, and then joined the faculty of Virginia Tech's Department of Computer Science. Having worked on ISCRAM-related topics since 2007, he has been co-author of ISCRAM conference/journal works in 2011, 2012, 2013, 2014, and 2019. His research and teaching includes digital libraries, Web archiving, information storage and retrieval, NLP/AI, and machine/deep learning. He is Executive Director of the Networked Digital Library of Theses and Dissertations (theses.org).

Pamela Murray-Tuite is an Associate Professor in Civil Engineering at Clemson University. Her research work is in areas of transportation, disasters and hazard, resilience, among others.

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References

1 CRISP Type 2/Collaborative Research: Coordinated, Behaviorally-Aware Recovery for Transportation and Power Disruptions (CBAR-tpd), NSF CMMI-1638207, PI Dr. Murray-Tuite at Clemson, subcontract to VT.