



# ISCRAM 2018

Rochester Institute of Technology  
Rochester, NY, USA

## POSTER: Intelligent Wireless Infrastructure Management for Emergency Communications

15<sup>th</sup> International Conference on  
INFORMATION SYSTEMS FOR CRISIS RESPONSE AND  
MANAGEMENT

*“Visualizing Crisis”*

**Workshops and Doctoral Symposium** May 20<sup>th</sup>, 2018

**Conference** May 21<sup>nd</sup>-23<sup>th</sup>, 2018

**Rochester New York - USA**  
Rochester Institute of Technology (RIT)  
<https://iscram2018.rit.edu/>

## INTRODUCTION TO THE POSTER

In 2012, the Congress authorized the creation of FirstNet to develop, build and operate a highly reliable broadband wireless network that will provide first responders advanced communication and collaboration technologies they need to help them do their jobs safely and effectively.

This poster describes the research of a collaborative faculty-led research that will enable first responders to identify and visualize geo-located quality of service and coverage gaps in wireless and deployable networks during an emergency event and support the deployment additional LTE base stations within FirstNet to augment network coverage and capacity.

## POSTER SUBJECT

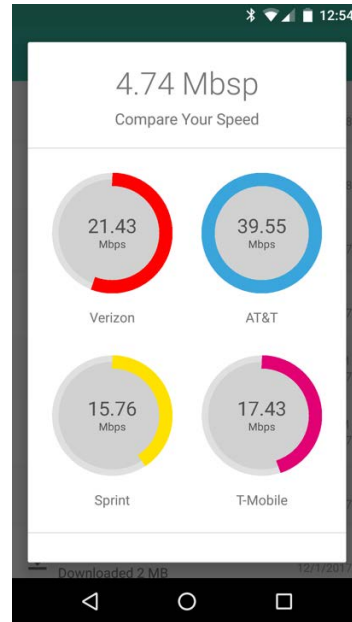
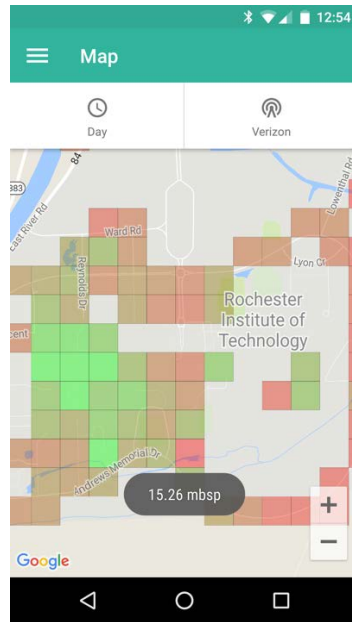
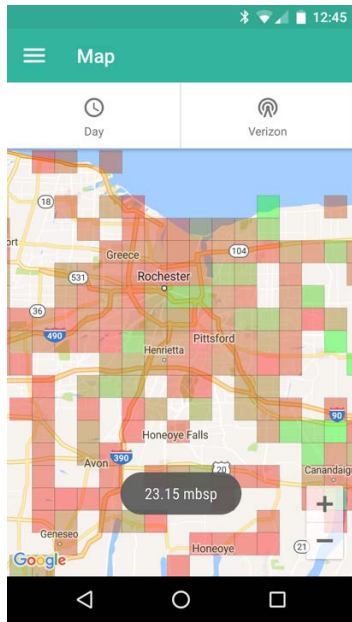
Reliable high-speed connectivity is essential for first responders. However, the demands on the network dramatically increase during an incident. Moreover, the availability of the wireless network is often impacted in the aftermath of a natural disaster.

Our crowd sourced cellular metrics system uses big data analytics to detect changes in coverage and usage patterns and recommends where to deploy additional communication assets. The approach uses machine learning methods to measure and model coverage gaps and automatically implement bandwidth prioritization on whatever communication assets are available.

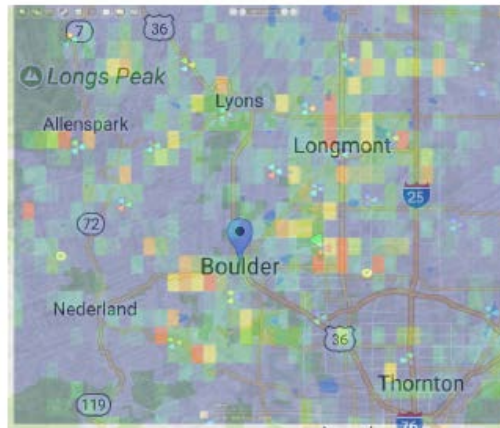
The deliverables include a GUI that provides the incident manager with information regarding operational performance in the geographic region managed by the deployable including:

- A real-time coverage map showing geo-located QoS
- The location of the individual user equipment within the coverage region
- The typical coverage in a specific area and where that coverage has now failed
- Determining and displaying the effective coverage gap – i.e. how much geo-located bandwidth is currently available versus how much is typically needed for this class of disaster
- Collection of QoS data over time for analysis and future capability enhancements

Example screen shots are shown below.



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## POSTER PRESENTER –

Dr. Nygate has over 30 years experience in telecommunication systems working for AT&T, Nortel, and Amdocs. He has developed emergency communications systems based on cellular technology for several countries.

\*Dr. Hochgraf is a co-founder of the RIT cellular metrics group which has developed a system for crowdsourced measurement of QoS in cellular networks. He has published on smartgrid and vehicle to vehicle communication and was a participant at the 2017 NIST PSCR Next Generation Deployable Networks Summit.

*\*Corresponding author*

*Dr. Johnson will present.*

	<p>Yossi Nygate, Ph.D. <a href="mailto:janiee@rit.edu">janiee@rit.edu</a> Rochester Institute of Technology</p>
	<p>William P. Johnson, Esq. <a href="mailto:wpjeee@rit.edu">wpjeee@rit.edu</a> Rochester Institute of Technology</p>
	<p>Mark Indelicato <a href="mailto:mjiiiee@rit.edu">mjiiiee@rit.edu</a> Rochester Institute of Technology</p>



Clark Hochgraf, Ph.D.

[cghiee@rit.edu](mailto:cghiee@rit.edu)

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