GUEST EDITORIAL PREFACE

Introduction to Selected Papers on Communication and Information Systems Technology for Emergency Management

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Persistent progress in Communication and Information System Technology has completely revamped the landscape of emergency preparedness and response. An emergency should here be understood as a situation that poses an immediate risk to health, life, property, or the environment, that already has caused losses in such respect, and that it has a high probability of escalating.

Until a few years ago the scarcity of information available during an emergency let responders in the dark. Pressing decisions had to be taken with very little knowledge of the situation.

Nowadays a huge amount of information from innumerable sources is available prior to an emergency event, during the event and after the event. Computers, mobile phones, smart phones, tablets, static and mobile sensors, etc transmit data and information through whatever infrastructure that is available – fixed networks, wireless networks, even using satellites. Admittedly, severe emergencies can knock out the existing communication channels. But in a surprising short time ad hoc networks come to the rescue.

The scarcity of data in emergencies is now history. Preparedness, response and even recovery today are challenged by information overload. How to filter relevant data and make sense of it to achieve full situation awareness is a primary challenge. In addition come the challenges to visualize and communicate emergency data, to boost decision support, to accurately inform the actors in emergencies – both first responders and affected citizens – and not to forget all kinds of stakeholders.

All in all, the research challenges are immense and they will keep us busy for decades to come. To facilitate the communication of

research in the area of on Communication and Information Systems Technology for Emergency Management a minitrack was started at the 2013 Hawai'i International Conference on System Sciences (HICSS) within the Collaboration Systems and Technologies track. The new minitrack attracted a satisfactory number of submissions from which eight were selected to be presented at the 2013 HICSS conference. Five of these eight papers were considerably extended and enhanced. This journal issue collects four papers. The fifth one, "Assignments of Collaborative Rescue Units during Emergency Response" by Felix Wex, Guido Schryen, and Dirk Neumann appeared in volume 5, issue 4 of this journal.

The first two papers deal with data collection to aid better management. The last two concern lessons learned, decision support and evacuation modeling.

"Designing Visual Analytic Tools for Emergency Operation Centers: A Qualitative Approach," by Richard Arias-Hernandez and Brian Fisher, argues that used-centered methods have proven successful to the design of emergency management information systems (EMIS) whereas the design of interactive visualizations has employed a less user-centered approach. The paper employs a user-centered qualitative method for the design and evaluation of visual analytic tools for emergency management. The authors apply the method to a case study of a design research project targeting prototypes of visual analytic tools for emergency operation centers in British Columbia.

"An Externalizable Model of Tactical Mission Control for Knowledge Transfer" by Dennis Anderson targets a very important and little explored issue, owing to its intrinsic difficulty. Emergencies do not follow scripts. Therefore the first responders must rely on experience from scenario-based training and prior missions. Acquiring, and retaining, such experience is thus essential to prepare for future events. The paper proposes an externalizable model with a knowledge base for capturing and retaining information for first responders in crises to support sharing of mission experience.

"Improving the Crisis to Crisis Learning Process" by Eliot Rich, Josune Hernantes, Ana Laugé, Leire Labaka, Jose M. Sarriegi, and Jose J. Gonzalez argues that post-mortem accounts of crises often identify factors that accumulate over time and increase the likelihood of failure. The authors discuss a systems-based model of crisis management developed for an EU project (SEMPOC). The SEMPOC study illuminates the role of knowledge sharing and its relation to the development of trust among organizations. The findings are being applied to a new, ongoing EU project (ELITE).

"Comparing Different Crowd Emergency Evacuation Models Based on Human Centered Sensing Criteria" by Jaziar Radianti, Ole-Christoffer Granmo, Noureddine Bouhmala, Parvaneh Sarshar, and Jose J. Gonzalez reviews widely used crowd models for emergency evacuation and discusses their advantages and shortages from the angle of human-centered sensing. The study identifies a number of research opportunities to improve evacuation in emergencies.

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Jose Julio Gonzalez holds a professorship in Information and Communication Technology at the Department for ICT, University of Agder, and an adjunct professorship at the Norwegian Information Security Lab, Gjøvik University College, both Norway. He has a doctor degree in natural sciences (mathematical physics) and a doctor degree in technology (polymer science). He has published in various areas of natural sciences, technology and social sciences. His current areas of interest are management of emergencies and critical infrastructure protection. He was director of the Centre of Integrated Emergency Management (CIEM) at the University of Agder 2011–2014.