



# Introduction to the DIRECT minitrack Disaster Information, Resilience, for Emergency and Crisis Technology

Frederick Benaben, Julie Dugdale, Elsa Negre, Mihoko Sakurai, Andrea Tapia

## ► To cite this version:

Frederick Benaben, Julie Dugdale, Elsa Negre, Mihoko Sakurai, Andrea Tapia. Introduction to the DIRECT minitrack Disaster Information, Resilience, for Emergency and Crisis Technology. HICSS2023 - 56th Hawaii International Conference on System Sciences, Jan 2023, Hawaii, United States. hal-04050535

**HAL Id: hal-04050535**

**<https://imt-mines-albi.hal.science/hal-04050535>**

Submitted on 29 Mar 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

## Introduction to the DIRECT minitrack Disaster Information, Resilience, for Emergency and Crisis Technology

Frederick Benaben  
IMT Mines Albi  
[frederick.benaben@mines-albi.fr](mailto:frederick.benaben@mines-albi.fr)

Julie Dugdale  
IMAG  
[Julie.Dugdale@imag.fr](mailto:Julie.Dugdale@imag.fr)

Elsa Negre  
Paris-Dauphine  
[elsa.negre@dauphine.fr](mailto:elsa.negre@dauphine.fr)

Mihoko Sakurai  
Intl Univ. of Japan  
[msakurai@glocom.ac.jp](mailto:msakurai@glocom.ac.jp)

Andrea Tapia  
Penn State Uni.  
[atapia@ist.psu.edu](mailto:atapia@ist.psu.edu)

### Abstract

*The DIRECT minitrack inherits from several past minitracks of the HICSS conference. This minitrack is part of the Digital Government Track and is one of the most popular of the conference (second highest number of submissions of all minitracks of the HICSS conference for HICSS 55). The DIRECT minitrack is clearly dedicated to be a meeting point for researchers about the broader topic of information technology for crisis management and security.*

### 1. Overview of the minitrack

The main objective of the DIRECT minitrack is to focus on **how technologies, information management, data sciences and artificial intelligence can contribute to support the role of governments and emergency management of public value purpose**. This topic stems from the following considerations.

The evolution and progress of our civilizations have brought our world into a state of hyper-connection, hyper-density and hyper-concentration which has, little by little, completely erased all the spaces of physical, organizational or structural absorption. Yet, these spaces were likely to limit the expansion of critical situations, thus preventing the number, the amplitude and the repercussions of crises. This statement of fact and the responsibility it highlights, not necessarily for humans but at least for the development of the human species, with respect to the frequency, gravity and propagation of the crises that affect our planet, reciprocally underlines the need for our species to take charge of managing these crises. It is therefore fundamentally on all the questions relating to the handling of these missions by the governance structures (whether they are global, continental, national, regional or local) that this DIRECT minitrack wishes to address: The serious challenges facing government in cities, regions and nations of the world relate to acute shocks (e.g. forest fires, floods, earthquakes, tsunamis, pandemics and

terrorist attacks) and chronic stresses (e.g. high unemployment, economic and energy crisis, religious extremism, inefficient public transport, endemic violence, chronic shortages of food and water).

Information is among the key life-supporting essentials in a disaster response, as well as water and basic foods which are vital to sustain lives. Above all, the recent pandemics, environmental changes, geopolitical tensions have shown how information (about contamination, about root causes, about trust, about stocks, about science and progress) could be at the heart of the crisis management. Information and Communication Technology (ICT) has, and will continue to profoundly change, disaster management in years to come. This, coupled with the impressive recent advances in artificial intelligence, offers huge potential for better management of crisis situations. Data and information management also guides us to build a disaster-resilient community which can adapt the society to those unexpected events. These issues should be tackled at each level of the governance (international, national, regional, local, etc.), and with regards to all relevant dimensions (social, technological, interoperability, agility, etc.).

The papers selected in the DIRECT minitrack deal with all aspects of the analysis, design, development, deployment, implementation, integration, operation, use or evaluation of ICT for crisis management, and resilient communities, especially in the perspective of discussing the roles of government and governance structures. These papers address any phase in the disaster management cycle: Prevention and mitigation; preparedness; alert; response; recovery; and post disaster. In addition, one key objective of the DIRECT minitrack is to support innovative and break-through visions regarding these topics.

### 2. Presentation of the selected papers

This section introduces the papers that have been selected for the DIRECT minitrack and broadly describes how they have been grouped to provide the attendees with a consistent and coherent flow of

presentations. Obviously, it makes almost no sense to reduce the selected articles to a generic group title, especially considering that these articles have been selected with regards to their quality and not to their consistency with some specific subcategories. However, it gives a significant vision of the main topics and of the colors of the research results that have been accepted.

## 2.1. Digital Citizens

In a world where technologies reduce the frontier between citizens and volunteers, three articles have been gathered according to that general topic of “Digital Citizens”, highly related to the broader topic of digital government. The notions of social media and social networks are never far from that matter, even if the trend seems to decrease with regards to past years:

- **Examining User Access Options for eGovernment Services During a Crisis from a Digital Inequality Perspective**, *Christopher Zobel, Duygu Pamukcu*
- **Design and Instantiation of IS2SAVE: An Information System to Predict the Influx of Spontaneous Volunteers at Operating Sites**, *Sebastian Lindner, Stephan Kuehnel*
- **Signals of Transition in Crisis Management: Insights from a Study of Social Media Use in Public Service Organizations**, *Lucia Castro Herrera, Terje Gjøsæter, Tim A. Majchrzak, Devinder Thapa*

## 2.2. Digital Services

That subcategory of “Digital Services” clearly represents the heart of the DIRECT minitrack. It presents digital innovations and emerging technologies for crisis and security management. It is also highly connected with the question of digital government as it concerns the digitalization of services. Four articles have been selected:

- **Autonomous Search and Rescue with Modeling and Simulation and Metrics**, *Trevor Bihl, Chadwick Cox, Yuki Adams, James Pennington*
- **Constraint-based Recommender System for Crisis Management Simulations**, *Ngoc Luyen Lê, Jinfeng Zhong, Elsa Negre, Marie-Hélène Abel*
- **A Framework for Virtual Training in Crisis Context and a Focus on the Animation Component: The Gamemaster Workshop**, *Alexis Evain, Audrey Fertier, Shane Halse, Jess Kropczynski, Frederick Benaben, David Panzoli, Robin Batard*
- **Digital Innovation of Healthcare Services in Times of Crisis and Beyond**, *Geir Inge Hausvik, Kirsti Askedal*

## 2.3. Lessons learned and feedback

Finally, four papers have been selected that relate quite directly to studies and analysis dedicated to characterize some dimensions of digital crisis management and information technologies. Again, this is highly related to the digital government roots of the minitrack as it is a strong set of inputs for roadmap and decision orientation:

- **The Technology Crisis in US-based Emergency Management: Toward a Well-Connected Future**, *Nicolas LaLone, Phoebe Toups Dugas, Bryan Semaan*
- **A Signal Detection Theory Approach to Predicting Immunity to Pandemic Vaccine Fake News**, *Jeremy Barajas, Richard John*
- **Data Management in Emergency Response: Observations from the Field During COVID19 and Storm Ana**, *Kenny Meesters, Olaf Steenbergen, Yan Wang*
- **The Past Two Decades in Disaster Information Management: Academic Contributors and Topical Evolution**, *Hans Jochen Scholl*

## 3. Conclusion

The DIRECT Minitrack aims at providing an accurate status of the research contributions located at the convergence of society (through citizens, government and institutions) and technology (through data science, artificial intelligence and other trends).

It is dedicated on the one hand to present very accomplished and achieved research results to highlight and emphasize these contributions. On the other hand, it also brings on the frontline emerging “crazy” ideas, as far as they are powerful and significant.