
Editorial

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Information and communication technology has advanced greatly in the last few years as a support for crisis response. There are many examples of successfully implemented solutions all over the world such as systems for early warning, decision making, command and control, etc. Responding to a disaster or crisis requires multiple parties (distributed agencies, task groups, and individuals) to be involved. These parties need to collaborate and coordinate their actions in order to optimise their efforts and the scarce resources for more effective results. This requirement is the aim of this special issue that is particularly interested in research and development in collaboration technologies and systems for the whole cycle of detection, prevention, response, and recovery of disaster management.

Without a resilient network infrastructure no effective actions can be undertaken in terms of communication between the involved persons, data collection, access to services or systems, etc. The following five papers deal with network aspects for communication and data collection.

Following a major disaster, the infrastructure supporting wired and mobile networking is expected to be inoperable over large areas. The solution proposed by the article 'A hybrid ad hoc networking protocol for disaster recovery resource management' is to deploy a large-scale peer-to-peer network after a disaster because of its fast and flexible deployment. However, this type of network requires cooperation among nodes that may use disparate communication models (for route building and optimisation, resource management, and localised status flooding). The authors propose a hybrid network protocol that dynamically assigns network capacity to these three communication models.

The articles 'Medium access control in wireless sensor networks: a survey' and 'RTCP: a redundancy aware topology control protocol for wireless sensor networks' focus on how to preserve the lifetime of a WSN used for the collection of vital data. To this end, the first article addresses the energy saving from the point of view of MAC protocols. It presents an interesting state of the art and outlines the improvements and the new research directions related to this issue. The second article proposes to save energy from the point of view of topology control. The proposed redundancy aware topology control protocol (RTCP) exploits the sensor redundancy to keep working a necessary set of nodes and turning off the redundant ones. RTCP provides applications the ability to parameterise the desired connectivity degree.

The articles 'Coordinated route reconfiguration for throughput optimisation under Rician fading channel' and 'Coverage enhancement with occlusion avoidance in networked rotational video sensors for post-disaster management' consider the WSN for the transmission of images and videos. The first article focuses on how to get the high throughput data transmission to deliver these ample sensor data in a post disaster scenario using mobile wireless sensor networks. The second article proposes a model of wireless video sensor networks (WVSNs) for post-disaster management in order to assist search and rescue operations by locating survivors, identifying risky areas and enhancing the overall situation awareness in real-time.

The three articles below address some of the collaboration issues related to the human complex disaster management organisation where multiple actors belonging to different and heterogeneous authorities collaborate and work together.

The article 'Architecture for gathering and integrating collaborative information for decision support in emergency situations' deals with the collaboration from the point of view of data collection. However, its concern is no longer in how to collect data but in

how to organise, aggregate and filter what is actually useful for crisis managers. This research proposes a collaborative information architecture for gathering and integrating information that has originated from different media resources (sensors, response teams in the field, and social media).

The article 'A framework combining agile, user-centred design and service-oriented architecture approaches for collaborative disaster management system design' proposes a novel design framework for complex disaster management systems by combining agile methods (AM), user-centred design (UCD) and service-oriented architecture (SOA) paradigm. It aims to take into account the advantages of the three approaches to support a dynamic and turbulent environment.

The article 'Constructing collective competence: a new CSCW-based approach' addresses the concept of collective competence. This concept applies in situations where the performance of groups and teams is more important than the persons' such as disaster management. More precisely, the authors study the process of construction of a collective competence that is based on collaboration through exchanges, confrontations, negotiations and interpersonal interactions. The authors present a computer-supported cooperative work or CSCW-based approach supporting collective competence construction and apply it on a case study in the field of e-maintenance.

Despite the number of recent successful stories on applying ICT in disaster management, there remain a lot of open research issues to investigate especially with the continuing advances in ICT that always raise new challenges to address.

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