



Human Autonomous Systems Collective Capability: Emergency Response

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Hurricane Katrina - Problems and Challenges

Systemic blockages hindered rescue operations and provoked emergent behaviour from victims on the ground



Emergency responders in rescue efforts following Hurricane Katrina experienced a number of problems. These included:

- Command – response agencies had conflicting command structures
- Coordination – destroyed communications infrastructure inhibited coordination
- Bureaucracy – procedures were generally too inflexible

Consequently, victims on the ground took action and in some cases, were able to respond more effectively than the official emergency responders. For example:

- A Wal-Mart employee obtained a bulldozer and drove through the store and distributed goods to victims
- A local resident spraypainted messages for help on rooftops using a fire extinguisher
- People with boats helped trapped people to evacuate

The Changing Nature of Collective Working in Emergency Response

How do first responders handle information from humans and autonomous agents in an emergency?

Based on the problems identified in the Hurricane Katrina case study, our work explored the potential impacts of working alongside humans and autonomous agents in a disaster.

In a simulated hurricane scenario, first responders received and shared information with other human responders and autonomous agents (UAVs). The source and type of information differed in terms of:

- Proximity
- Agent – human or autonomous
- Urgency

Findings:

- Behaviour varied from rigid and rule-bound decision making to flexible and iterative
- Resources were used in novel and unofficial ways
- Responders tended to trust and collaborate with the autonomous agents
- Responders utilised the autonomous agents to save time and perform tasks more efficiently

