Shared Situation Awareness
During Crisis Situations among Distibuted Teams

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The aim of our project

• Study the concept of shared situation awareness from a multidisciplinary perspective.
• To design a computational model to simulate shared situation awareness.
• Two articles written during the project, one about the computational model and the other one a systematic review.

What is situation awareness (SA)?

• Can be defined as a state of knowledge, or *knowing what is going on* during a particular situation. It is the awareness one perceives, understands and interprets from his or hers' environment.
• SA is to a large extent considered to be an individual construct.
• Many influential factors, including stress, attention span, emotions, professional or personal abilities, workload, comprehension, goals etc.
• SA has proved to be a valuable term for scientists from diverse scientific fields backgrounds researching accidents, risks, crisis and emergencies.


Should I tell him
I am here ?

An example of bad situation awareness

Shared situation awareness

• Can be described as what SA elements team members share and have in common with each other.
• Having an adequate shared SA (or common operational picture) is crucial for all kinds of groups of agents that have to solve tasks in a distributed manner.
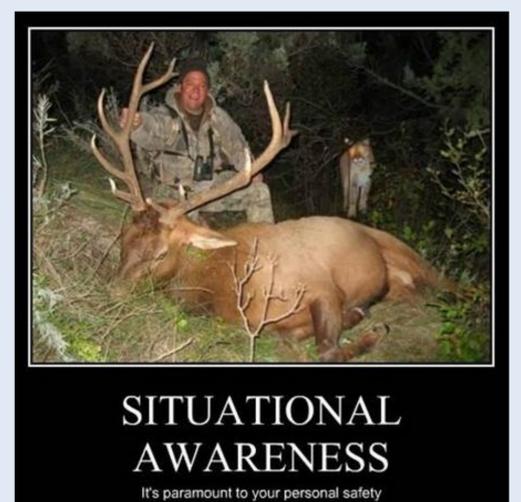
The computational model

• Enables researchers, practitioners and policy makers alike to perform controlled social experiments on shared SA in an artificial environment.
• Explores a variety of hypothetical scenarios in an automated manner by means of 'what-if' simulations.
• Agents are moving around in a particular physical area (e.g. an airport, a city).
• Area is implemented as 2D array of objects (e.g. a building, a road).
• Agents move around the area based on their interest maximizing their belief about objects.
• Agents beliefs are updated based on observation as well as communication with other agents.
• Observation and communication are subject to errors and incorrect beliefs which is visible by the grey-scale in the modeling application (see Screen 1).
• The model is available online via http://majdan.eu/sa/
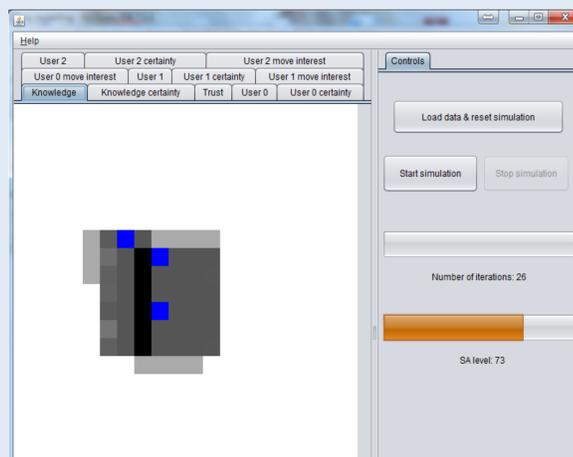
Screen 1 - Belief view. It shows a global view of all agents beliefs. Color of each pixel represents the level of belief (black is correct belief, white is wrong or no belief, grey are values in between). Blue pixels are the agents who move in the area.

Computational model. Comparison of different hypothetical scenarios

SITUATIONAL AWARENESS
It's paramount to your personal safety

An example of bad situation awareness

Screen 2 – Agents' move interest view. The matrix represents the level of user's interest in moving in specific elements in area. It is available for each user. Similar to screen 1, the color represents the level of agent's interest (black is maximum value, white is no interest, grey are values in between).
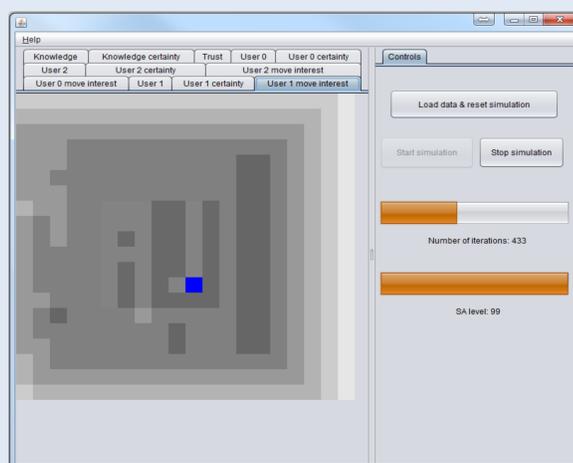
Conclusion

This project is the result of a joint effort between computer scientists and social scientists. It was driven by the desire to better understand the concept of shared SA. We did so by designing and making simulations on a self-designed computational model and research the current literature that exists on the concept. Current simulation tests show that the model reflects shared SA well.

Systematic review article

We are currently writing a systematic review article about SA. We are reflecting on how trust, culture and safety are problematized and dealt with in the literature.