

## **NeoCITIES Transactive Memory System for Geo-Collaboration in Emergency Crisis Management**

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**Project Scope:** In emergency crisis response situations where multiple response teams are involved, attaining a common operational picture is a major challenge – especially when the command centers are in distinct locations. Transactive memory exists as one or more people interact with others to access, store or retrieve joint memories that represent historic or situational knowledge. Our project demonstrates proof-of-concept for a Transactive Memory system to facilitate decision-making and resource allocation by emergency personnel during a crisis scenario. This work builds on our prior research involving NeoCITIES scaled world simulation. NeoCITIES is a team resource allocation problem, which abstracts emergent situations involved in real-life emergencies. Crisis management is conducted through the joint interactions of a Police team, a Fire/EMS team, and a Hazardous Materials team. Teams must assess individual events in a given crisis scenario, interact with other teams based on their roles and allocate sufficient resources to successfully tackle an event.

**Recent Progress:** We have developed an interactive prototype for the transactive memory system using Mimio - a commercial white board application, MSN instant messenger and VRML browsers. The prototype provides an interactive environment on a shared platform to externally represent and keep track of emergency service resources of the three teams - both spatially and temporally. It enables key players to benefit from each other's knowledge and expertise in responding to crisis situations through perceptual anchoring. Key features of the prototype interface include: a shared campus map which can be annotated, a communication/chat module and the ability to track location of resources visually. Elements in the map, especially the buildings are hyperlinked to their interactive 3d models to plan evacuation strategies, identify potential hiding points etc.

**Future Plans:** Currently we have secured Institutional Review Board approval to conduct focus group discussions and knowledge elicitation sessions with emergency crisis management domain experts. These knowledge elicitation sessions and discussions will help further improve the prototype and prepare ground for developing a fully functional transactive memory system. We also plan to integrate other work within our research group on use of mobile devices and spatial annotations into this prototype.

**Relevance to listed research areas:** The NeoCITIES transactive memory system works as a visual communication-collaboration aid for emergency response teams to maintain a common operational picture. It can be also be used in training emergency response personnel by simulating crisis scenarios and as a tool to quickly compare various response options. Thus our work is relevant to the areas of *Emergency Preparedness and Response* as well as *Communications and Interoperability*.