

Shared Decision making in Human-Agent Teams:

A case study of crowd evacuation

Part 1: Steps 1-2

1. Design and implement a multiagent system for crowd evacuation in a large-scale indoor disaster environment such as a stadium or a transportation depot with several doorways for exit. During evacuation, a few doors might be inaccessible. Consider nominal numbers of 12 doors, 3 agents, and a crowd of 100 individuals. The agent models of the crowd movement are simplistic and will only move them out through doorways. A human operator will collaborate with a number of autonomous agents in evacuation. Evacuation tasks are open and close exit doors and stand in strategic positions to attract crowd movement. The operator will have a global view of the environment and can perform all tasks as agents but at slower speeds and accuracies. The operator can delegate tasks to agents by assigning them to regions or positions. Agents are networked and share a mental map of their actions and effects but not with human operator. Agents can perform many independent tasks. They may also delegate task to operator.
2. As interactions between the operator and a specific agent occur continually, a measure of trust develops between the pair. Use a model of human-agent trust update to build and maintain trust that changes with each interaction.

Part 2: Step 3

3. Measure and demonstrate the speeds and accuracies of evacuation with human only, MAS only, and with varying levels of HA trust in the system.