

# **The GRaPPa Lab: Supporting Team Decision Making in Complex Environments**

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## **Abstract**

The GRaPPa (Group Psychology and Performance) Lab operates within the School of Informatics at Indiana University Purdue University Indianapolis (IUPUI), in cooperation with the User Simulation and Experience Research Lab. The focus of our research is on interdependent teams in technologically complex work environments characterized by uncertainty, stress, high risk, changing moods, and varying levels of expertise.

The GRaPPa Lab employs a mixed-methodological approach. Field studies provide rich and nuanced knowledge about individuals and teams at work in complex environments. Likewise, controlled laboratory experiments have provided the foundation for countless contributions to our understanding of the human characteristics that impact the development and use of systems, devices, and environments. Yet such experiments are limited in what they can tell us about work situated in real-world settings, just as field studies are limited in their support for precision and replicability. The GRaPPa Lab leverages the strengths of both through the use of simulated task environments and scaled worlds in the search for holistic assessments of group behavior and task performance.

This poster will showcase aspects of an ongoing research program, *Bridging the Situation Space to Decision Space Gap*. This project is examining the modeling and visualization of decision space information to supplement situation space information in the contexts of disease contagion and emergency management. To enhance the decision support of emergency responders, we are examining the ability of decision space visualization tools to enhance option awareness and support more robust decision making. This work is focused on detailing the impact of the decision space information provided to users, relating the correctness of decisions to the levels of complexity represented in the events, and the affordances for understanding alternative actions. This ongoing project is focused on prototyping multiple visualization methods and testing them in human-in-the-loop experiments based on the domain of emergency crisis management. In addition, the computer models underlying the decision space are being expanded to support increasingly complex situations. This research provides further insight into the value of decision space information and option awareness for users working in complex environments.