

Explaining Intelligent Behavior in Military Simulations for Analysis and Tutoring

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As artificial intelligence (AI) systems and behavior models in military simulations become increasingly complex, it has been difficult for users to understand the activities of computer-controlled entities. The *Explainable AI* project (XAI) at the Institute for Creative Technologies, University of Southern California is developing technologies to explicate the behaviors, decisions, and motivations of such automated entities. The aim is broad, both in the sense of intended audience (analysts, trainees, and instructors) and the kinds of knowledge targeted for explanation (strategic, tactical, and interpersonal skills). Proof of concept systems have been produced for the training aid, *Full Spectrum Command* and for the military stimulation, *OneSAF Objective System* (OOS). Currently, our work is following three distinct, but closely related paths: (1) supporting deep reasoning questions for analysis and tutoring (e.g., those related to decision-making and entity motivation), (2) developing a modular tutoring component to conduct detailed after-action reviews (AARs), and (3) improving the natural language capabilities of the system (e.g., supporting requests for elaboration and clarification, generating appropriate feedback based on student actions). The questions to be supported in XAI come from a master list of over a hundred generic question types distilled from a variety of sources including analysis of AAR recordings, discussion with subject matter experts, and a collaboration with the RAND Corporation. This presentation will focus on the technical details of how the XAI system can answer these questions as well as giving a demonstration of the XAI system in OOS.

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