

IGEL

Intelligent Guided Experiential Learning



Currently, many simulations and games for learning are built without mechanisms for guidance. As a result, these games rely on discovery learning to achieve their pedagogical objectives, which has been shown to be ineffective for learners in new domains. To help address this problem, the Intelligent Guided Experiential Learning (IGEL) project seeks to provide automated guidance in immersive and game-based learning environments with the general goals of enhancing understanding, reducing frustration, and promoting retention and transfer.

IGEL research has produced several intelligent tutoring systems (ITSs) focusing on complex domains such as leadership, culture, communication skills, and negotiation. Early prototypes provided support in the form of explainable artificial intelligence (XAI): using the underlying simulation behavior models, learners could ask questions about observed events, decisions, and outcomes. The answers, delivered as natural language responses from the agents, sought to reveal the intricacies of the underlying models so that learners could make accurate attributions for their successes and/or failures. Prototypes were completed for the ICT virtual human project, as well as for tactical simulations, including the OneSAF Objective System and ICT's Full Spectrum Command serious game for company commanders.

More recent work has focused on teaching negotiation skills with cultural awareness in the context of BiLAT, an ICT-developed serious game currently in broad use by the U.S. Army. IGEL provides two kinds of support in BiLAT. The first is coaching, explicit support during meetings with BiLAT characters in the form of hints and feedback. This coaching requires ongoing assessment of learner actions, a model of how to successfully conduct meetings, and a pedagogical model defining when and how to deliver feedback. The second type of guidance comes from a reflective tutor that conducts a post-exercise discussion using the after-action review (AAR) framework of investigating what happened, why it happened, and how to sustain or improve student performance. A similar approach is being taken with ICT's UrbanSim application, which focuses on teaching principles of counterinsurgency operations.

GOALS

- Provide support for learners in immersive and game-based learning environments with the goal of increasing retention and transfer.
- Apply findings from the learning sciences to model effective pedagogical strategies to provide feedback, guidance, and reflection on practice.
- Build artificial intelligence technologies (e.g., natural language processing and tutorial planning) to advance intelligent tutoring system capabilities and enhance learning.
- Conduct experiments to identify optimal levels of learning support and demonstrate effectiveness.

USC Institute for Creative Technologies

12015 Waterfront Drive | Playa Vista | CA 90094 | 310.574.5700 | 310.574.5752 fax | info@ict.usc.edu
ict.usc.edu | twitter.com/usc_ict | youtube.com/USCICT | facebook.com/USCICT