ElectronixTutor is an Intelligent Tutoring System (ITS) focusing on Navy Apprentice Technician Training courses in basic electricity and electronics. The goal of this effort is to supplement the existing instructor-led training with advanced learning environments (ITS and other adaptive learning technologies) that sailors can complete at their own pace.

Using ElectronixTutor, sailors will be able to access selected readings from their Naval A-School curriculum, converse with their tutor (a computer agent) in natural language, engage in deep-reasoning question-answering with their tutor, answer multiple-choice questions, explore and construct mental models of circuits in a simulation environment, and interact with figures through a Point and Query facility to find answers to common questions. Data from the experience of each sailor is recorded in the student model, so that intelligent recommendations can be made to focus a sailor’s attention on the knowledge components where they need additional practice and in the mode in which they need to continue their training.

**RESEARCH CHALLENGES AND OPPORTUNITIES**

- Helping sailors learn with the latest advances in learning technologies on the web.
- Tracking the knowledge, emotions, and psychological characteristics of the individual sailor and their impacts on learning.
- Recommending the right learning resource on the right topic at the right time for an individual sailor.
- Summarizing performance of sailors and presenting results to the individuals and their instructors.
- Improving learning, retention, and transfer of training by applying principles of cognitive science, data mining, and learning analytics.
ElectronixTutor collects performance measures on each instructional module, such as time on task, percent correct, the match between scores for trainee behavior and expectations, and mastery of knowledge components associated with each topic. These performance measures are stored in a data repository that updates the student model. An intelligent recommender system uses this data to decide which learning module and knowledge components should be recommended to the learner for additional practice. The student model profile of the sailor informs these decisions as follows:

1) Session features are extracted from the Learning Record Store (xAPI, TLA, and GIFT).
2) Student mastery on Knowledge Components is estimated and resources organized to maximize learning.
3) Resources are reweighted to match active topics opened by sailors as well as the course curriculum.

For further information on this exhibit, or business opportunities with ONR, please contact the Training S&T Program Officer, Human & Bioengineered Division, Warfighter Performance Department, Office of Naval Research at (703) 696-4501, or by mail at Office of Naval Research, 875 N. Randolph St., Arlington, VA 22203.