Opportunity Title: Experimental Cognition in Adaptive Automation
Opportunity Reference Code: ARL-C-HRED-1910230637

Organization DEVCOM Army Research Laboratory

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Description

About the Research

The use of robotic assets in the field instead of soldiers is one approach to protecting soldiers from harm. The approach requires the development of intelligent robots that also have a high degree of autonomy. To accomplish this, ARL has developed a robotic control system that has increased the capabilities of robots to act without requiring constant human operator supervision. The system is based on the cognitive modeling system ACT-R (Adaptive Control of Thought–Rational), which itself is based on a plethora of empirical research investigating cognitive psychology. Associates will ideally have a strong background in cognitive psychology and particularly cognitive modeling within cognitive modeling systems (e.g., ACT-R Soar, EPIC). A strong background in robotics is not required, though learning the robotic control system will be required once the Associate begins the program. Research will be conducted to identify important cognitive skills that humans use to solve spatial navigation problems and how these skills may be incorporated into the robotic control system. Common tools used in cognitive psychology, such as experimentation, task analysis, and human factors analysis may be incorporated into the proposed research project. Use of ARL's facilities such as the Robotic Test Bed is strongly encouraged. The study of autonomous robotic systems is a field that represents tremendous growth and opportunity to be published in the psychology, cognitive, cognitive modeling, and computer science literatures.

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About HRED

The Human Research and Engineering Directorate (HRED) is ARL's principal center for research and development directed toward optimizing Soldier performance and human-autonomy teaming. Research within HRED focuses on how to improve Soldier performance in a dynamic and changing battlefield. As technology and autonomous systems become an increasingly integral part of Soldier teams, it is critical to determine how these systems can work with and be adapted to the Soldier and their capabilities. Autonomous systems must be able to be integrated into Soldier teams and move from tools to teammates. Critical to this is an understanding of how humans and human teams perform and change in dynamic environments and situations. HRED leverages human-robot interaction, human-informed machine learning, human cognition and adaptive teaming to improve human-autonomy teaming for future Army teams.

About ARL-RAP

The Army Research Laboratory Research Associateship Program (ARL-RAP) is designed to significantly increase the involvement of creative and

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highly trained scientists and engineers from academia and industry in scientific and technical areas of interest and relevance to the Army. Scientists and Engineers at the CCDCArmy Research Laboratory (ARL) help shape and execute the Army's program for meeting the challenge of developing technologies that will support Army forces in meeting future operational needs by pursuing scientific research and technological developments in diverse fields such as: applied mathematics, atmospheric characterization, simulation and human modeling, digital/optical signal processing, nanotechnology, material science and technology, multifunctional technology, combustion processes, propulsion and flight physics, communication and networking, and computational and information sciences.

A complete application includes:

- **Curriculum Vitae or Resume**
- **Three References Forms**
  - An email with a link to the reference form will be available in Zintellect to the applicant upon completion of the on-line application. Please send this email to persons you have selected to complete a reference.
  - References should be from persons familiar with your educational and professional qualifications (include your thesis or dissertation advisor, if applicable)
- **Transcripts**
  - Transcript verifying receipt of degree must be submitted with the application. Student/unofficial copy is acceptable

If selected by an advisor the participant will also be required to write a **research proposal** to submit to the ARL-RAP review panel for :

- Research topic should relate to a specific opportunity at ARL (see Research Areas)
- The objective of the research topic should be clear and have a defined outcome
- Explain the direction you plan to pursue
- Include expected period for completing the study
- Include a brief background such as preparation and motivation for the research
- References of published efforts may be used to improve the proposal

A link to upload the proposal will be provided to the applicant once the advisor has made their selection.

Questions about this opportunity? Please email ARLFellowship@orau.org

Point of Contact ARL-RAP

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 month(s).

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- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (3 👁)
  - **Computer, Information, and Data Sciences** (16 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (45 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
- **Age:** Must be 18 years of age