

**Opportunity Title:** Understanding and Quantifying Human-Autonomy Shared Situational Awareness

**Opportunity Reference Code:** ARL-R-HRED-300051

**Organization** DEVCOM Army Research Laboratory

**Reference Code** ARL-R-HRED-300051

### **Description About the Research**

The Human Autonomy Teaming (HAT) Essential Research Program (ERP) within the Army Research Laboratory examines four research thrusts: enabling Soldiers to predict AI, quantifying Soldier understanding for AI, Soldier-guided AI adaptation, and characterizing Soldier-autonomy performance. Goals are to understand how Soldier teams operate with autonomous systems, how these systems become team members, and how we can quantify successful human-autonomy team performance. Critical to meeting these goals is determining how to measure and quantify a shared understanding between humans and autonomy. Skills critical to this research are: quantification of human and team behavior, quantification of autonomous system skills and limitations, understanding of human-AI communication skills and abilities, and reinforcement and machine learning. Soldier-autonomy teams will operate in dynamic environments, so solutions to these goals must be adaptable and robust.

**Keywords:** Situational Awareness; Teams; Artificial Intelligence; Human performance; Human robotics; Reinforcement learning

*ARL Advisor:* Katherine Cox

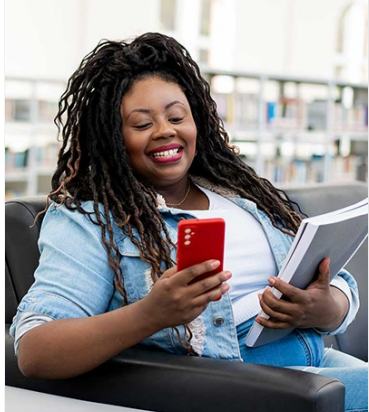

*ARL Advisor Email:* [katherine.r.cox11.civ@mail.mil](mailto:katherine.r.cox11.civ@mail.mil)

### **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 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



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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](mailto:ARLFellowship@orau.org)

- Eligibility Requirements**
- **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree.
  - **Academic Level(s):** Any academic level.
  - **Discipline(s):**
    - **Computer, Information, and Data Sciences** ([16](#) )
    - **Engineering** ([27](#) )
    - **Other Non-Science & Engineering** ([1](#) )
    - **Social and Behavioral Sciences** ([2](#) )
  - **Age:** Must be 18 years of age