Opportunity Title: Human-in-the-Loop Reinforcement Learning for Real-World Robotics Applications
Opportunity Reference Code: ARL-R-HRED-300038

Organization DEVCOM Army Research Laboratory

Reference Code ARL-R-HRED-300038

Description

About the Research

The Army Research Laboratory (ARL) has a research opportunity available in the research and development of human-in-the-loop reinforcement learning (RL) systems. Specifically, ARL is looking for an outstanding individual to advance development of human-in-the-loop deep reinforcement learning techniques for solving complex, real world robotics applications (such as obstacle avoidance, path navigation and grasping tasks). A successful candidate will have expertise in one or more of the following areas: Robotics, statistical classification and machine learning methods, deep reinforcement learning, optimal control, experimental design, and computer programming. Emphasis will be on translational research and technology development that will leverage current internal ARL research on human-in-the-loop RL. Candidate will support the short-term goal of developing a working proof-of-concept system that demonstrates the viability human-in-the-loop RL control in robotic environments. The candidate will perform system development, conduct experiments, publish papers, and integrate ideas and methods with the ongoing efforts of a multidisciplinary research team.

ARL Advisor: Nicholas Waytowich

ARL Advisor Email: nicholas.r.waytowich.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 man-machine interactions. The HRED examines human performance in the perceptual, cognitive, and psychomotor domains in order to increase the body of knowledge of human capabilities and limitations, and to assess the impact of emerging technologies on soldier performance. Research is conducted on intelligent decision aids and interfaces; human control of automated systems; control display and workstation design; and MANPRINT design, analysis, and integration methods. In addition, the HRED develops unique and innovative methods, tools, models, and simulations for measuring and characterizing soldier performance.

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 operational needs by pursuing scientific research and technological

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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.or

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 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
- **Age:** Must be 18 years of age