Opportunity Title: Human in the loop optimization of adaptive human-technology systems
Opportunity Reference Code: ARL-R-HRED-300139

Organization	DEVCOM Army Research Laboratory
Reference Code	ARL-R-HRED-300139
Description	**About the Research**

We have an open position for a postdoctoral/research fellow to work on the development and implementation of EEG-based, passive brain-computer interfaces (BCIs) for optimization of human-machine teams, such as exoskeletons for physical augmentation in defense applications. The aim will be to leverage EEG signals and/or other biosignals to passively estimate the user's state (i.e. cognitive load, physical load, perceived error) to facilitate interaction between humans and adaptive systems. The postdoctoral/research fellow will be part of a multidisciplinary team of neuroscientists, biomedical/mechanical engineers, and biomechanists and work at the intersection of computational neuroscience, mobile brain-body imaging, and human machine integration research to implement closed-loop, passive BCIs to achieve human-system mutual adaptation. This position is best suited for an individual with a broad computational background interested in online classification of human state via EEG and/or other biosignals and integration with closed-loop systems. The candidate will support the goal of developing a test bed to demonstrate and enable research in the area of human in the loop optimization of adaptive human-system teams. The postdoctoral fellow will also have the opportunity to design and carry out human subjects experimentation to uncover novel biosignal based metrics that track human-system performance in mobile scenarios.

Required skills:

MS/PhD or equivalent in neuroscience, biomedical engineering, computer science, or related fields
Expertise in machine-learning and/or online BCI
Advanced programming skills (i.e. Python, Matlab, R) and strong experience in algorithmic design, mathematical models, and signal processing
Excellent verbal and written communication skills
Strong publication record
Ability to work effectively both independently and in collaboration with multiple investigators

Desired skills:

Experience collecting and analyzing EEG
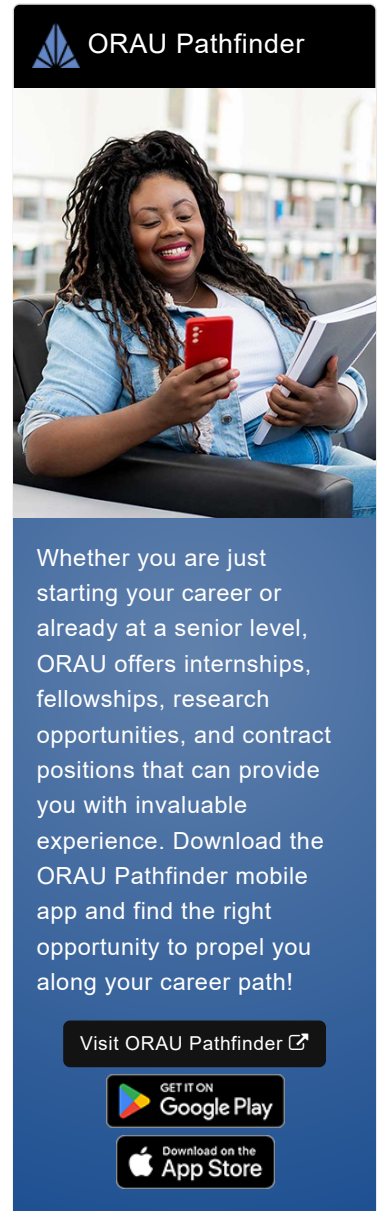Advanced signal processing experience
Human subjects research experience

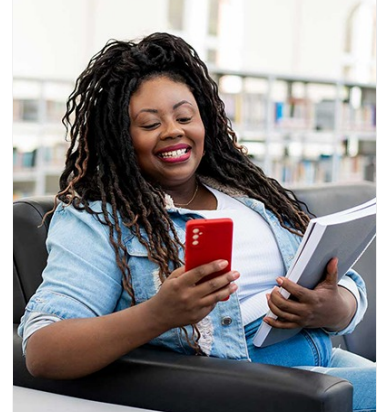There may be some flexibility in primary work location.

ARL Advisor: **J. Cortney Bradford**

ARL Advisor Email: **jessica.c.bradford.civ@army.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 CCDC Army 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.

Eligibility Requirements	
	- **Degree:** Master's Degree or Doctoral Degree.
	- **Academic Level(s):** Any academic level.
	- **Discipline(s):**
	- **Computer, Information, and Data Sciences** (17 👁)
	- **Engineering** (27 👁)
	- **Life Health and Medical Sciences** (45 👁)
	- **Mathematics and Statistics** (11 👁)
	- **Physics** (16 👁)
	- **Social and Behavioral Sciences** (22 👁)