Opportunity Title: Multi-Modal, Multi-Resolution, Multi-Source State Classification and Prediction
Opportunity Reference Code: ARL-R-CISD-300045

Organization DEVCOM Army Research Laboratory

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Description **About the Research**

The aim of this research is to develop computational methods to estimate and model a person's state, (which may consist of their affective, psychological, physiological state, or their gestures and actions), from a set of sensor data about that person. This research is also aimed at predicting a person's next state given their current one and the set of sensor information about them. Research opportunities exist in the following areas:

- Modeling the correlations between different output states
- Integration or fusion of sensor data from multiple sources measuring different modalities of information operating at multiple time scales
- Processing sensor data of the autonomic and central nervous system in non-stationary settings
- Real-time classification of streaming multimodal sensor data
- State prediction from multimodal sensor data
- Biologically inspired methods for pattern recognition and discrimination
- Modeling cross modality interactions

This research project will combine many fields of study, including, machine classification, EEG/ERP processing, EKG/ICG processing, gesture recognition, neuromorphic computing, and signal processing. Associates with experience in or more fields are preferred. Interested candidates should contact Dr. Harrison prior to submitting a research proposal.

ARL Advisor: Andre V. Harrison

ARL Advisor Email: andre.v.harrison2.civ@mail.mil

About CISD

The Computational and Information Sciences Directorate (CISD) conducts research in a variety of disciplines relevant to achieving and implementing the so-called digital battlefield. Problems address the sensing, distribution, analysis, and display of information in the modern battle space. CISD research focuses on four major areas: communications, atmospheric modeling, battlefield visualization, and computing

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

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 month(s).
- **Academic Level(s):** Faculty.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (1 👁)
  - **Computer, Information, and Data Sciences** (16 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (1 👁)
  - **Life Health and Medical Sciences** (45 👁)
  - **Mathematics and Statistics** (10 👁)

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  - **Other Non-Science & Engineering** (5 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (28 👁)
- **Age:** Must be 18 years of age