

Opportunity Title: Faculty Fellowship for conducting AI Model Optimization
Research for Inference Acceleration in Edge Computing Environments
Opportunity Reference Code: ARL-R-NCCS-400034-F1

Organization DEVCOM Army Research Laboratory

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Description About the Research

- The aim of this research is to develop theoretical and experimental approaches for generalized AI model inference acceleration on resource constrained heterogeneous edge computing platforms. This research is also aimed at predicting optimal AI model architecture through neural network architecture search (NAS) to achieve expected inference acceleration. The research covers both convolutional neural networks and large language models for their inference acceleration.

This project covers the following research topics:

- Develop mathematical models to understand the trade-off between accuracy, latency, and compression of optimized AI models.
- Investigate state-of-the-art, quantization, model pruning and other AI model computational complexity reduction approaches for inference acceleration on edge computing platforms with resource constraints.
- Formulate mathematical theoretical foundations and mathematical models to guide the optimization process and ensure convergence to optimal solution while satisfying all the constraints.
- Develop layer-wise gradual optimization approaches.

ARL Advisor:

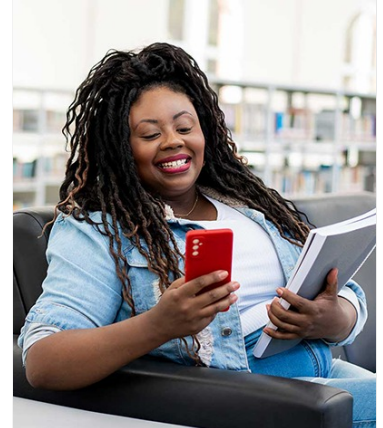
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About ARD

ARL's Army Research Directorate (ARD) focuses on exploiting concept development, discovery, technology development, and transition of the most promising disruptive science and technology to deliver to the Army fundamentally advantageous science-based capabilities through laboratory's 11 research competencies. This intramural research directorate also manages the laboratory's essential research programs, which are flagship research efforts focused on delivering defined outcomes.

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



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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.

About NETWORK CYBER & COMPUTATIONAL SCIENCES (NCCS)

Sciences to enable and ensure secure resilient communication networks for distributed analytics in Multi-Domain Operations.

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











Questions about this opportunity? Please email ARLFellowship@ora.u.org.

Point of Contact [ARL](#)

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|---------------------------------|--|
| Eligibility Requirements | <ul style="list-style-type: none">• Citizenship: U.S. Citizen Only• Degree: Doctoral Degree.• Academic Level(s): Doctoral Degree 5+ years (Senior Fellow) or Faculty.• Discipline(s):<ul style="list-style-type: none">◦ Chemistry and Materials Sciences (12 ) |
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- **Communications and Graphics Design** ([2](#) )
- **Computer, Information, and Data Sciences** ([17](#) )
- **Earth and Geosciences** ([21](#) )
- **Engineering** ([27](#) )
- **Environmental and Marine Sciences** ([14](#) )
- **Life Health and Medical Sciences** ([51](#) )
- **Mathematics and Statistics** ([11](#) )
- **Physics** ([16](#) )
- **Science & Engineering-related** ([2](#) )
- **Social and Behavioral Sciences** ([29](#) )