Opportunity Title: Optimization of DNN based computer vision algorithms for resource constrained tactical edge
Opportunity Reference Code: ARL-C-CISD-300106

Organization DEVCOM Army Research Laboratory

Reference Code ARL-C-CISD-300106

Description **About the Research**

Objection detection and sematic segmentation-based computer vision algorithms have become an essential element of visual scene understanding used by many tactical edge computing devices. In general, computer vision algorithms deploy complex deep neural network architectures that are computationally complex and not optimized for resource constrained, edge computing devices. In this opportunity, we will be profiling several computer vision algorithms and optimizing them for the deployment over edge computing platforms with resource constraints. During this project, we will also develop a generalized model switching framework for dynamic loading of models to meet both resource constraints and mission requirements. The selected candidate will collaborate with a both internal and external collaborators to advance the project goals.

ARL Advisor: Venkateswara R. Dasari; Noah Weston

ARL Advisor Email: venkateswara.r.dasari.civ@mail.mil; noah.d.weston.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:

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- **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:** Master's Degree or Doctoral Degree.
- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Engineering** (27 👁)