Opportunity Title: Machine Vision and Learning for eXplainable AI (XAI)
Opportunity Reference Code: 0017-NPP-MAR25-LRC-Aero

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0017-NPP-MAR25-LRC-Aero

How to Apply All applications must be submitted in Zintellect

Please visit the NASA Postdoctoral Program website for application instructions and requirements: How to Apply | NASA Postdoctoral Program (orau.org)

A complete application to the NASA Postdoctoral Program includes:

1. Research proposal
2. Three letters of recommendation
3. Official doctoral transcript documents

Application Deadline 3/1/2025 6:00:59 PM Eastern Time Zone

Description **About the NASA Postdoctoral Program**

The NASA Postdoctoral Program (NPP) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed to advance NASA's missions in space science, Earth science, aeronautics, space operations, exploration systems, and astrobiology.

Description:

NASA Langley Research Center is seeking a postdoctoral researcher with expertise in computer vision to develop learning methods (including deep learning) using electro-optical sensors to explore novel applications of autonomous systems, with an emphasis on small Unmanned Aerial Systems (sUAS). The successful candidate should hold a doctoral degree in a field related to computer vision and machine learning (e.g., electrical engineering, computer science, applied mathematics) and will perform cutting-edge research as a team member in the project ATTRACTOR: Autonomy Teaming & TRAnsparency for Complex Trusted Operational Reliability. The objective of ATTRACTOR is to develop approaches to imbue Verification & Validation (V&V) into mission planning and execution via AI explainability (XAI) in training, decision-making, and object recognition; analyzable trajectories; natural interaction for human-machine teaming; and persistent modeling and simulation for engendering justifiable trust in autonomous systems. This requires enhanced neural network-based object classifiers that provide sub-object descriptions of the resulting classification in an effort to develop explainability. This position will involve the development of neural networks that rely on electro-optical and other sensor modalities for autonomous applications within the ATTRACTOR project goals, especially V&V and uncertainty quantification in object recognition, and should lead to publication(s) in top tier journals and conferences (e.g., CVPR, RSS, ICRA, AIAA, IEEE). Possible candidate tasks include: rapid training, tuning, and testing of neural networks, object

tracking, scene classification, contextual learning, multi-modal learning, stereo vision, pose estimation, and collision avoidance. All developed methods and products must be accompanied by uncertainty quantification in support of approaches to V&V for autonomous systems. The candidate should include a list of publications related to deep learning (and preferably pre-prints for articles that may be under review). Demonstrated strong software skills applied to solving Machine Learning and/or Computer Vision problems is a pre-requisite. Experience developing on NVIDIA Jetson products, ROS, CAFFE, OpenCV, or participating in machine learning challenges are pluses.

Location:
Langley Research Center
Hampton, Virginia

Field of Science: Aeronautics

Advisors:
Bonnie Allen
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757-864-7364

Eligibility is currently open to:

- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,
- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

Questions about this opportunity? Please email npp@orau.org

Eligibility Requirements

- **Degree:** Doctoral Degree.