

Opportunity Title: Big Data, Machine Learning, AI for Homeland Security

Missions

Opportunity Reference Code: DHS-RPP-DA-TC-2026

Organization U.S. Department of Homeland Security (DHS)

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How to Apply Click the *Apply* button below

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Application Deadline 9/21/2026 11:59:59 PM Eastern Time Zone

Description The Advanced Computing Lab at the Department of Homeland Security (DHS), Science and Technology Directorate (S&T) is seeking passionate self-starters to participate in research and development (R&D) for the next generation of cyber-physical simulation and defense. This next generation requires moving beyond traditional, static information technology (IT) security to model the dynamic physical consequences of cyber-attacks on the nation's most critical infrastructure—including power grids, water systems, natural gas pipelines, and other infrastructure like seaports.

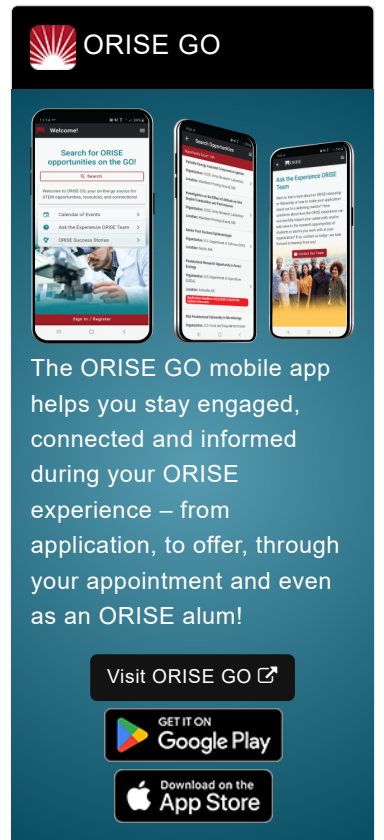
This appointment is hands-on, and the selected participant **should** have a background that allows them to understand data and multiphysics models of complex systems and translate them into scalable, high-performance code. Participants will have the opportunity to learn to apply and hone these skills and acquire additional ones as they work on real-world problems.

Examples of Research Areas:

- **Cyber-Physical Modeling:** Researching and developing high-fidelity virtualized environments, including emulation and simulation of industrial control systems, communication layers such as TCP/IP and peer-to-peer protocols, intelligent electronic devices, and physical simulators of critical infrastructure systems. This includes modeling how digital commands and network activity interact with physical infrastructure, such as pipeline pressure, grid stability, or voltage behavior.
- **Applied Mathematics to Code:** Translating complex physical equations (differential equations) into modular, reusable software components to build scalable digital twins.
- **Generative AI:** Application of Large Language Models (LLMs) to generate synthetic data for digital twins and their role in supporting cyber-physical systems.
- **Advanced AI & Analytics:** Exploring the intersections of Artificial Intelligence (AI) and physics, including diffusion models, Physics-Informed Neural Networks (PINNs), Neural Ordinary Differential Equations (Neural ODEs), and broader LLM applications.
- **Knowledge Graphs:** Developing Knowledge Graph architectures to map complex interdependencies and uncover insights across multi-sector systems. Explore how knowledge graphs can support digital twins.

Location

Washington, D.C. or remote from within the United States. The location will be coordinated with the participant's mentor.



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Provisions

Selected participants will receive a competitive stipend for living and other expenses during this appointment as determined by DHS. Stipends are determined by the participant's academic standing, discipline, and professional background.

Participants may also be eligible to receive:

- Health insurance allowance.
- Reimbursement for travel expenses.
- Travel/training allowance for professional development and travel to professional meetings, such as conferences.

Duration

Generally, appointments are for one year and may be extended based upon project needs and funding availability.

Nature of the Appointment

You will not enter into an employee/employer relationship with ORISE, ORAU, DHS or any other office or agency. Instead, you will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.

Security Clearance

Although you will not enter into an employee/employer relationship with ORISE, ORAU, DHS or any other office or agency, you must have or be eligible to obtain and maintain a security clearance for the duration of your appointment. It is expected that after completing the necessary application for clearance a fitness determination will allow participation to begin with unclassified material, while awaiting a clearance.

The successful applicant(s) will be required to comply with Environmental, Safety and Health (ES&H) requirements of the host facility, including but not limited to, COVID-19 requirements (e.g., facial covering, physical distancing, testing, vaccination).

Qualifications To qualify for this opportunity you must,

- Be 18 years of age or older at time of application.
- Be currently pursuing or have received a Bachelor's, Master's, or Doctoral degree from an accredited college or university in a desired discipline (Please see full list of disciplines below under Eligibility Requirements).
- Be a U.S. citizen.

A complete application consists of:

- A Completed Zintellect profile.
- Completed Essay Questions - the application includes questions specific to the opportunity.
- A Current Resume/CV.
- Academic Records: The applicant must submit records for the most recent degree or degree in progress. Unofficial transcripts or copies of academic records provided by the applicant or by academic advisors from internal institutional systems may be submitted. Copies of official transcripts may be required if an appointment is offered.
- One Recommendation - Applicants are required to provide the name and contact information (i.e., email and telephone number) for one recommender who can speak to the applicant's relevant skills, reliability,

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judgment, communication, and ability to learn in a research environment. The sponsor may contact the reference and request completion of an evaluation form prior to selection or appointment.

If you have questions, please send an email to DHSED@orau.org with DHS-RPP-DATC-2026 in the subject line.

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree.
 - **Discipline(s):**
 - **Computer, Information, and Data Sciences** ([17](#)👁)
 - **Engineering** ([8](#)👁)
 - **Mathematics and Statistics** ([11](#)👁)
 - **Age:** Must be 18 years of age