

**Opportunity Title:** Data Management for Autonomous System Summer Internship

**Opportunity Reference Code:** ERDC-ITL-2023-0028

**Organization** U.S. Department of Defense (DOD)

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**How to Apply** Click on *Apply* now to start your application.

**Description** The DEVCOM Army Research Laboratory (ARL) 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 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 research fields.

The Military Information Experimentation Branch at DEVCOM Army Research Laboratory Robotics Research and Collaboration Campus in White Marsh, Maryland, provides support for experiments using robotic systems. Research includes using human sized platforms moving at operational speeds in unstructured environments.

#### What will I be doing?

Under the guidance of a mentor, you will be an integral part of the Military Information Experimentation Branch efforts providing data management and analysis for robotic experiments. The focus will be large datasets collected by the AIMM ERP, involving ground platforms navigating in unstructured environments. After an introduction to HPC, you will be introduced to the ARL Ground Autonomy Stack to understand the type of data being collected and analyzed. You will then go through the recently developed data analysis pipeline using a recently collected dataset. The data will be uploaded to an HPC system, find a relevant point of interest, extract that information into a smaller log and run existing data analysis tools against that log. You will be introduced to the Robot Operating System, the Phoenix ground autonomy stack and how it is used in on HPC. You will learn how to work with large datasets, and the process to create analysis products relevant to ongoing research.

Week 1-2: Obtain access to HPC systems, meet with AIMM scientists, understand system architecture and understand the data analysis workflow. Introduction to HPC, getting setup with relevant access.

Week 2-4: Introduction to the ARL Ground Autonomy Stack (Phoenix), Robot Operating System (ROS) and ROSbag data format

Week 4-6: Learn to use RACER data store system on HPC, uploading data for processing, accessing available datasets, while documenting process and issues.

Week 6-8: Use python interface to datastore to find key points, (ie manual interventions, emergency stops) and create extractions relevant to those points, documenting process and issues.

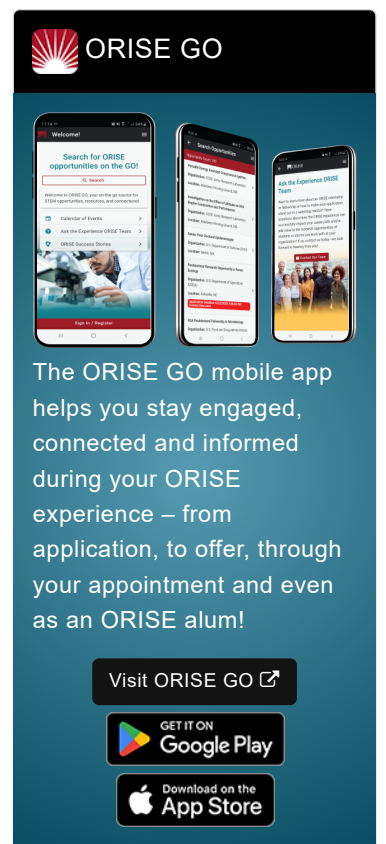
Week 8-10: Use existing tools or expand upon existing tools to create analysis products from datasets. This includes videos of various data streams and could include charts or spreadsheets of collected data.

Week 10-12: Finalize briefing report, poster and presentation.

#### Why should I apply?


This fellowship provides the opportunity to independently utilize your skills and engage with experts in innovative ideas to move the proposed research forward.


**Where will I be located?** White Marsh, Maryland




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**What is the anticipated start date?** June 2023

Exact start dates will be determined at the time of selection and in coordination with the selected candidate.

**What is the appointment length?**

This appointment is a summer research appointment. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

**What are the benefits?**

You will receive a stipend to be determined by the sponsor. Stipends are typically based on a participant's academic standing, discipline, experience, and research facility location. Other benefits may include the following:

- Health Insurance Supplement (*Participants are eligible to purchase health insurance through ORISE*)
- Relocation Allowance
- Training and Travel Allowance

#### **About ORISE**

This program, administered by Oak Ridge Associated Universities (ORAU) through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and DoD. Participants do not enter into an employee/employer relationship with ORISE, ORAU, DoD 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. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE. For more information, visit the [ORISE Research Participation Program at the U.S. Department of Defense](#).

**Qualifications** Background experience in a Linux environment and using Python3. Comfortable using the Command Line.

Desired Experience: Robot Operating System, Containerization (Singularity/Docker)

**Security Investigation:** Applicants should be able to pass a National Agency Check and Inquiries (NACI) security investigation should they be selected and accept the internship offer.

#### **Application Requirements**





A complete application consists of:

- Zintellect Profile
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - For this opportunity, an official transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. [Click here for detailed information about acceptable transcripts](#).
- One recommendation. Your application will be considered incomplete and will not be reviewed

until one recommendation is submitted. We encourage you to contact your recommender(s) as soon as you start your application to ensure they are able to complete the recommendation form and to let them know to expect a message from Zintellect. Recommenders will be asked to rate your scientific capabilities, personal characteristics, and describe how they know you. You can always log back in to your Zintellect account and check the status of your application.

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blacked out, blackened out, made illegible, etc.) prior to uploading into the application system. All documents must be in English or include an official English translation. If you have questions, send an email to [USACE@orise.orau.gov](mailto:USACE@orise.orau.gov). Please list the reference code of this opportunity in the subject line of the email. Please understand that ORISE does not review applications or select applicants; selections are made by the sponsoring agency identified on this opportunity. All application materials should be submitted via the "Apply" button at the bottom of this opportunity listing. Please do not send application materials to the email address above.

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- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
  - **Degree:** Bachelor's Degree or Master's Degree received within the last 60 months or currently pursuing.
  - **Overall GPA:** 3.00
  - **Discipline(s):**
    - **Computer, Information, and Data Sciences** ([17](#) )
    - **Engineering** ([27](#) )
    - **Mathematics and Statistics** ([11](#) )
    - **Physics** ([16](#) )
  - **Age:** Must be 18 years of age
  - **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).