Opportunity Title: Data Science / Computer Engineering Summer Internship
Opportunity Reference Code: ERDC-ITL-2023-0027

Organization U.S. Department of Defense (DOD)

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

Description The U.S. Army Research Laboratory Army Research Directorate, DoD Supercomputing Resource Center conducts research critical to the Army's assured land power dominance into the deep future. They work with emerging computational platforms and architectures, advanced algorithms, data-intensive analysis workflows, and immersive visualization tools, among other areas. Their facilities include high performance computers, emerging processors, development platforms, and a mixed-reality visualization lab.

Project: Seeking two student interns to investigate the development of a distributed processing and analysis pipeline for a user to efficiently analyze test data. This stems from the need for users to explore large amounts of heterogenous data, leveraging HPC resources to provide an enduring capability for data exploration, analytics, and reporting.

What will I be doing?

Under the guidance of a mentor, you begin with an exploratory introduction of the problem set at hand. It will consist of meetings with domain scientists to understand both the test data and the current workflow on the HPC resources. You will get a survey of the current software stack, workflows, and analytic models. You will also learn the basics of HPC usage. From this knowledge, a plan will be devised on how to extend the capabilities and integrate pieces of the pipeline into one collection of data science services.

Intern #1

Will prototype various configurations for scaling up the analytical workflows on the HPC systems. The intern will study components such as the Spark processing engine configuration, orchestration and allocation implementations for running services on HPC nodes vs PSF, and the existing analytical model implementations. The intern will brainstorm a few deployment setups for running the data processing and analytics in a scalable matter, and implement one.

Intern #2

Will enhance the capabilities of the tool stack by generalizing models and exploring larger feature sets from the data at hand. This includes conducting data exploration, developing explainable machine learning models, and containerizing services.

Once each intern has prototyped their solutions, they will collaborate together to integrate and run the one interns' latest model training implementation using the other interns' new tools deployment. The final step is to evaluate both model performance and runtime performance, and suggest recommendations for future directions with model design and tools deployment.

The HPC resources utilized will include Chessie, Jean, and ATC's DHPI Prometheus, with a focus on containerizing services and exploring PSF. The project would have significant considerations with regards to big data analytics, building on prior ARL research and HIP efforts to analyze and visualize data at scale. The interns will become familiar with the data domain, determine a set of appropriate data elements and analytic techniques, implement those techniques, and evaluate the approaches for effectiveness and performance.

Why should I apply?

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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? APG, Maryland

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

The candidate should be pursuing a Bachelor's or Master's Degree in Computer Science, Engineering, Math, Statistics, or similar STEM discipline. Preferred experience with Python, Linux, and Data Science concepts.

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

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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.

If you have questions, send an email to 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.

Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Associate's 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).