Opportunity Title: Machine Learning: Aerospace/Mechanical Engineering Summer Internship
Opportunity Reference Code: ERDC-ITL-2023-0016

Organization U.S. Department of Defense (DOD)

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How to Apply Click on *Apply* at the bottom of the opportunity to start your application.

Description Technology Development Directorate (TDD) is the rotorcraft aeromechanics research branch under the U.S. Army Combat Capabilities Development Command (CCDC). TDD is looking for summer interns to contribute to the development and application of the multi-disciplinary rotorcraft simulation software CREATE-AV Helios. The interns will contribute towards the assessment and validation study of the GPU solver, assist with the development and testing of the flight dynamics module, and help further the development of the Machine Learning (ML) based reduced order aerodynamic model in Helios.

What will I be doing?

As an Oak Ridge Institute for Science and Education (ORISE) participant, you will join a community of scientists and researchers in an effort to develop and test GPU capabilities within Helios and assess advanced capabilities on problems of interest to the Army FVL program. The first project will be development and assessment of high order numerical algorithms on GPU architectures. The second project will explore the development and testing of the new flight dynamics module. The third project will contribute to further the development of Machine-Learning based reduced order model in Helios.

Why should I apply?

Under the guidance of a mentor, you will engage in a variety of research activities, including:

- Developing and evaluating high order numerical algorithms on GPU architectures
- Assessing the performance of the GPU solvers and helping to improve the efficiency
- Developing and testing the new flight dynamics module
- Trim testing and validation for novel multi-rotor concepts,
- Developing methods for simulating aircraft response to small perturbations about the trim conditions
- Designing and coupling an interface to couple a control system with Helios
- Evaluating the existing capability and enhancing the approach by generating well-structured training data sets and improving training procedures
- Compiling a professional quality publication suitable for presentation at a major aerospace conference

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. Applications are reviewed on an ongoing basis and fellowships will be filled as qualified candidates are identified.

Where will I be located? Moffett Field, California

What is the appointment length?

This appointment is a ten-week research appointment, with the possibility to be renewed for additional research periods. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

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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 qualified candidate should be a graduate student or received a Master's or Doctoral degree in Aerospace/Mechanical Engineering.

Highly competitive applicants will have education and/or experience in one or more of the following:

- Background in the field of rotary wings
- Familiarity with Machine Learning algorithms, GPU architectures, and Python
- Prior software and graphical user interface development experience

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 - Please upload a copy of a transcript for your current or most recent degree program that meets the disciplinary qualifications of the opportunity. Click here for detailed information about acceptable transcripts.
- One Recommendation. Your application will be considered incomplete and will not be reviewed until one recommendation(s) 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

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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 [ERDC-ITL-2023-0016] 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:** Bachelor's Degree, Master's Degree, or Doctoral 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).