Opportunity Title: Applied Aerodynamics: Naval Air Warfare Center Summer Internship
Opportunity Reference Code: ERDC-ITL-2023-0022

Organization U.S. Department of Defense (DOD)

Reference Code ERDC-ITL-2023-0022

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

Description The Applied Aerodynamics Branch at the Naval Air Warfare Center Aircraft Division supports development of new and improved aerodynamic technologies to fixed wing and rotary wing aircraft. Provides aerodynamic research required by the Navy; develops and validates methods for aerodynamic and performance analysis; derives, maintains, and improves engineering criteria, techniques, and methodologies for predicting the aerodynamic characteristics for which other aeromechanics competencies are responsible; and aerodynamic analysis as required by outside competencies dealing with external aerodynamic interaction effects. Defines and conducts aerodynamic Science and Technology research programs. Provides advanced modeling of aircraft/ship air-wake interaction. Provides the development and application of computational fluid dynamics while conducting research into fundamental aerodynamic principles and advanced aerodynamic concepts. Conducts analytic investigations to derive, maintain, and improve engineering criteria, techniques, and methodologies for predicting aerodynamic characteristics; reducing the technical risk associated with the design and development of aircraft. Develops and validates concepts and methods for reducing aerodynamic drag or increasing usable aerodynamic lift in flight vehicle configurations. Provides computational fluid dynamics analysis, lower level theoretical and empirical analysis, and experimental test support to characterize the aerodynamics of air vehicles.

Project: The CREATE-AV Kestrel and/or Helios CFD solvers will be validated against ship/helicopter integration experimental data recently acquired by the U.S. Navy. CFD models will be executed and computed against full-scale or model-scale test data in the form of flow field measurements, surface pressures, and body loads. The effect of solver type, grid density, turbulence modeling, wall effects, etc. will be examined

What will I be doing?

The project will expose you to many of the challenging aspects of conducting ship/helicopter integration CFD analyses such as grid generation, case management, flow visualization, and loads analysis. You will have the opportunity to analyze real-world full-scale and/or model-scale test data.

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

- Grid generation
- Determine target test conditions (in collaboration with mentor) and set up matching CFD cases
- Execute CFD runs on HPC systems
- Develop post-processing scripts to CFD results to experimental data
- Document methodology and results
- Learn skills valuable to any STEM field such as time management; data post-processing, including code development; and documentation of results

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? Patuxent River, Maryland

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What is the anticipated start date?

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 internships will be filled as qualified candidates are identified.

What is the appointment length?

This appointment is a summer 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.

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 have a bachelor's degree or higher in Mechanical or Aerospace Engineering. Candidate must have basic understanding of aerodynamics and numerical methods, preferably with a knowledge of computational fluid dynamics. Rotary wing experience is desired, though not required. The qualified candidate will have the following skills:

- Familiar with at least 1 CFD code (e.g. Kestrel, Helios, Overflow, OpenFOAM, STAR-CCM+)
- Familar with post-processing software (e.g. Ensight, Tecplot, Paraview, Matlab)
- Proficient in at least 1 programming language (e.g. Python, C/C++, Fortran, Matlab)

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

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- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - Please upload a copy of an official 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 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 (blanked 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. 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:** 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).