Opportunity Title: Structural Engineering - Faculty
Opportunity Reference Code: ERDC-ITL-2021-0001-F

Organization U.S. Department of Defense (DOD)

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

Description The US Army Engineer Research and Development Center (ERDC) is an integral component of the Office of the Assistant Secretary of Defense for Research and Engineering and helps solve our Nation's most challenging problems in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, Department of Defense, civilian agencies, and our Nation's public good. ERDC strives to be the world's premier public engineering and environmental sciences research and development organization.

ERDC's Civil Works research, development and technology business area contributes to the strength of the Nation by providing innovative and environmentally sustainable solutions to the Nation's water resources challenges. As the Nation's water resources are under increasing pressure from competing uses, the state-of-the-art technologies developed by ERDC researchers help provide safe and resilient communities and infrastructure and help American goods compete in the global marketplace. Furthermore, ERDC's science and technology help the Corps manage existing water resources infrastructure sustainably--in the face of expected climate change and land use change, invasion by exotic species, demographic shifts, and aging structures--to meet the needs of future generations.

The Information Technology Laboratory (ITL), part of the U.S. Army Engineer Research and Development Center (ERDC), is a premier Department of Defense (DoD) laboratory engaged in the creation and application of advanced information technology in support of the warfighter and the Nation. ITL helps enable the missions of the ERDC, Army, DoD, and other agencies by conceiving, planning, managing, conducting, and coordinating research and development (R&D) in high-performance computing (HPC), data science, computer-aided and interdisciplinary engineering, high performance data analytics (HPDA), software engineering, computer science, systems engineering, cybersecurity, and instrumentation systems. Through a balanced program of R&D and demonstration, ITL advances the Army's knowledge and ability to use revolutionary information technology to address a wide range of engineering and scientific challenges.

What will I be doing?

You will research the use of Carbon Fiber Reinforce Polymer (CFRP) and Basalt patches on the strength and ductility of repaired Steel Hydraulic Structures subjected to corrosion. These studies should consider the following:

1) Randomness in workmanship when cleaning the corroded surfaces and applying the repairs.

2) Randomness in material properties and their effect on strength and ductility of the repaired sections.
3) Effect of tension, compression, shear, and bending on the repaired sections and the subsequent effect on strength and ductility.

These objectives must be addressed by conducting experimental tests and numerical simulations at various scales. The result of this study will be documented in a final report. A brief description of the research, the technical approach, and deliverables are presented below.

1) Define Key Performance and Testing Parameters.
2) Perform bending, compression, tension, and shear load tests on Retrofitted Specimens.
3) Conduct Experimental Testing of Repaired and Unrepaired (Damaged and Undamaged) Specimens.
4) Quantification of Statistical Variations in Repair Quality and Material Property.
5) Development of Probabilistic Mathematical Models and a Design Tool.
6) Provide Recommendations and Summary of Results.

Where will I be located? Fort Collins, Colorado

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.

What is the anticipated start date?

ERDC-ITL is ready to make an appointment immediately. Exact start date will be determined at the time of selection and in coordination with the selected candidate.

What are the benefits?

You will receive a stipend to be determined by ERDC-ITL. Stipends are typically based on the 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

This ORISE appointment is a part-time twelve month opportunity. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

Nature of the Appointment

You will not enter into an employee/employer relationship with ORISE, ORAU, DOD, or any other office or agency. Instead, you will be affiliated

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with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.

Qualifications

PhD in structural engineering and at least 10–years of experience in the areas of finite element analysis and experimental mechanics on fatigue and fracture problems related to navigation steel structures, and 10–years of experience conducting studies on fatigue and fracture and corrosion assessment of steel structures.

A complete application consists of:

- Zintellect profile
- Educational and Employment History
- Curriculum Vitae (PDF)
- Salary Certification from your university

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. 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. All documents must be in English or include an official English translation.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (6 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)