

Opportunity Title: Postdoctoral Researcher in Water Distribution Systems

Resilience

Opportunity Reference Code: AFIT-2021-0084

Organization U.S. Department of Defense (DOD)

Reference Code AFIT-2021-0084

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

Description A research opportunity is available for a recent PhD graduate on a joint project with the US Army Corps of Engineers and the Air Force Institute of Technology in Dayton, OH.

What will I be doing?

You will join a community of scientists and researchers in an effort to minimize cost and risk to drinking water infrastructure.

Every critical mission on Department of Defense (DOD) installations is impacted by the resilience, quality, and quantity of water supply. The procurement of a reliable water supply is hampered by aging infrastructure and limited investment capital. Therefore, there is a need for targeted investment into infrastructure to minimize cost and risk to drinking water infrastructure. The project couples hydraulic modeling with topological modeling to identify opportunities and vulnerabilities in water distribution systems to promote system resilience.

We are looking for a postdoctoral researcher with a background in water resources engineering, data analysis, and resilience to evaluate water distribution systems and promote best asset management practices for resilience. We anticipate investigating a series of scenario analyses across multiple DOD installations using both hydraulic and topological models to understand system performance. Tools used include network theory, hydraulic modeling in EPANET, and risk analysis. The research will answer questions about water distribution system vulnerability and impact to facility missions.

Why should I apply?

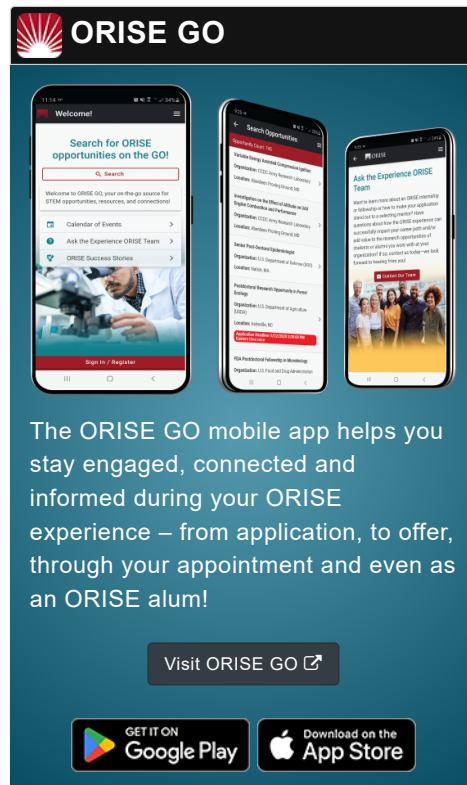
Under the guidance of a mentor, you will gain hands-on experience to complement your education and support your academic and professional goals. Along the way, you will engage in activities and research in several areas. These include, but are not limited to:

- Develop relationships between hydraulic and topological models of drinking water systems
- Create and identify suitable topological metrics that can be used in an asset management framework
- Publish and present relevant results in prominent journals and conferences
- Analyze and compare critical infrastructure systems to identify patterns and potential investment strategies for enhancing resilience
- Gain an Increased understanding of WNTR and EPANet Programs
- R and Python based analysis of topological models

Where will I be located?

Wright Patterson Air Force Base, Ohio

What is the anticipated start date?



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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/fellowships will be filled as qualified candidates are identified.

What is the appointment length?

This appointment is a twelve month 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 **AFIT**. 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 the Air Force Institute of Technology

The Air Force Institute of Technology, or AFIT, located at Wright-Patterson Air Force Base, Ohio, is the Air Force's graduate school of engineering and management as well as its institution for technical professional continuing education. A component of Air University and Air Education and Training Command, AFIT is committed to providing defense-focused graduate and professional continuing education and research to sustain the technological supremacy of America's air, space and cyber forces.

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

A qualified candidate will have or be currently pursuing a Ph.D. in a relevant field and be able to conduct independent research under the guidance of Dr. Christopher Chini at the Air Force Institute of Technology. United States citizenship or permanent residency is required for security clearance.

Highly competitive candidates will have:

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- Experience with EPANET or WINTR software is ideal but not required.
- Skills in dataset management including geospatial and statistical information through the R, Matlab, or Python programming languages.
- Background in engineering design and risk that relates to resilience assessment in water systems
- Previous examples of mentoring undergraduate or graduate students will be looked upon favorably.

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 unofficial 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.](#)
- 1 Recommendation(s)

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 AIRFORCE@orise.ora.gov. Please list the reference code of this opportunity (AFIT-2021-0069) in the subject line of the email.

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Eligibility Requirements

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
 - **Engineering** (27 )