

Opportunity Title: Explainable Artificial Intelligence and Topological Data Analysis
(Part-Time)

Opportunity Reference Code: AFRL711HPW-2019-0022

Organization U.S. Department of Defense (DOD)

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How to Apply Components of the online application are as follows:

- Profile Information
- 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.](#)
- Number of Recommendations required-1

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blacked out, blackened out, made illegible, etc.) prior to uploading into the application system.

If you have questions, send an email to airforce@orise.orau.gov. Please list the reference code of this opportunity in the subject line of the email.

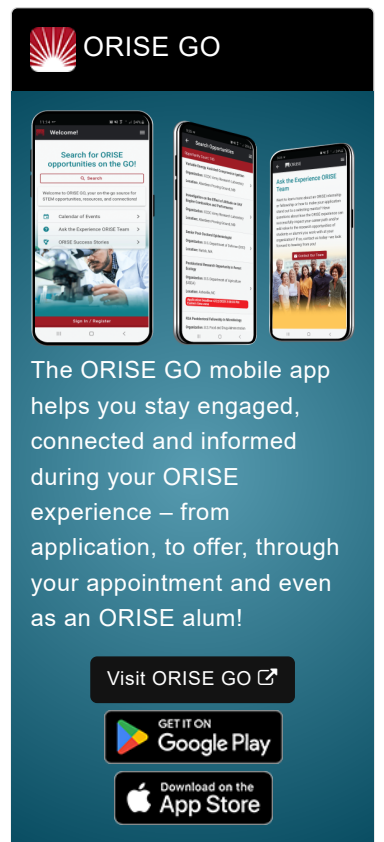
All documents must be in English or include an official English translation.

Description The Air Force Research Laboratory (AFRL) 711th Human Performance Wing (711 HPW) is a unique combination of three units: the Airman Systems Directorate (RH), the US Air Force School of Aerospace Medicine (USAFSAM) and the Human Systems Integration Directorate (HP). The synergies of combining the ideas, resources and technologies of these units position the 711 HPW as a world leader in the study and advancement of human performance. For more information about the 711th HPW, please visit: <https://www.wpafb.af.mil/afri/711hpw/>

AFRL is a leading institution in the discovery, evaluation, and transition of revolutionary auditory and communication technologies that optimize warfighters' tactical and strategic decision making, survivability, and lethality across the full range of battlespace environments.


The research facility is located within the 711th Human Performance Wing, Warfighter Interface division located within Building 248 at Wright Patterson AFB.


The Explainable Artificial Intelligence and Topological Data Analysis program seeks to implement next-generation machine learning approaches that generalize across multiple domains and use cases. The program seeks to utilize the mathematical underpinnings of topological data analysis to formulate feature extraction methods, deep topological architecting principles for classification and prediction, and provide ensemble model approaches for direct visualization of machine derived results. The participant will be developing new methodologies that use the above approaches to increase efficiency in computation, create novel methodologies that aid in enhancing prediction and classification, and apply




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the methodologies to specific use cases relevant to DoD applications. The ORISE appointment seeks to develop AFRL workforce in this rapidly emerging artificial intelligence research. The research from this fellowship may produce publication of the results in top journals. The program additionally will train the participant in standard analytical approaches and advanced visualization systems.

Appointment Length

This appointment is a ten 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.

Participant Benefits

Participants will receive a stipend to be determined by USAFRL. 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

Nature of Appointment

The participant will not enter into an employee/employer relationship with ORISE, ORAU, DOD, or any other office or agency. Instead, the participant will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.



Qualifications Candidates should be currently pursuing a bachelor's or master's degree, and will graduate by 2021.

Candidates should have a background in implementing topological data analysis methods and some background in standard analytical processing.

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Currently pursuing a Bachelor's Degree or Master's Degree to be received by 4/30/2021 11:59:00 PM.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#))
 - **Communications and Graphics Design** ([2](#))
 - **Computer, Information, and Data Sciences** ([16](#))
 - **Earth and Geosciences** ([21](#))
 - **Engineering** ([27](#))
 - **Environmental and Marine Sciences** ([14](#))
 - **Life Health and Medical Sciences** ([45](#))
 - **Mathematics and Statistics** ([10](#))
 - **Other Non-Science & Engineering** ([2](#))
 - **Physics** ([16](#))

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- **Science & Engineering-related** ([1](#) )
- **Social and Behavioral Sciences** ([27](#) )