Opportunity Title: Monterey Phoenix STEM Research Participation Program
Opportunity Reference Code: NPS-2021-0001

Organization U.S. Department of Defense (DOD)

Reference Code NPS-2021-0001

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.
- One 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.

If you have questions, send an email to NAVY@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.

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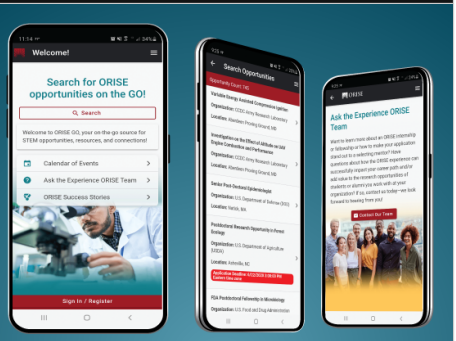

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Description

Monterey Phoenix (MP) is a US Navy-developed, open-source language, approach, and tool for modeling system and process behaviors. Its unique scenario generation feature gives a comprehensive set of scenarios for a system or process. Learners of MP are showing how it can be used to expose and control unexpected and unacceptable system behaviors. You can read more about MP from the website: https://wiki.nps.edu/display/MP/

There are three possible tracks for this opportunity:
1) Track 1: Monterey Phoenix Use for Emergent Behavior Analysis
2) Track 2: Monterey Phoenix Software Development
3) Track 3: A Computer Vision-based User Input Modality for Monterey Phoenix

Applicants should indicate which track they are interested in being considered for. Fellows from all tracks will be assigned to

the Monterey Phoenix research team and interact with a mentor on tasks based on their academic background, qualifications and interests.

For more information about NPS, visit: https://my.nps.edu/

Track 1 Description:
Fellows in this track will focus on developing intermediate modeling skills in the MP language through model development and peer coaching. Fellows will learn MP under the supervision of one of our experienced staff. As an embedded member of our research and agile development team, fellows in this track could:
- experiment with new techniques for conducting emergent behavior analysis
- experiment with new techniques for conducting risk, cost, schedule, or system/process performance analyses
- publish new MP models on the Uses page of our website (https://wiki.nps.edu/display/MP)
- assist with coaching new MP learners during virtual immersion workshops, learning sprints, and internships
- help make an advanced system and software quality assurance tool accessible to many more users
- improve tutorials and documentation about MP

Track 2 Description:
Fellows in this track will focus on developing code to enrich MP functionality and adoption following the acquisition of some basic modeling skills in the MP language in order gain a general and basic user perspective. As an embedded member of our research and agile development team, fellows will interact with an experienced mentor on the following programming tasks:
- learn RIGAL, the compiler language used by MP
- edit the RIGAL code to extend MP features and functionality
- improve compiler error messages to deliver more feedback to the MP users
- use a git workflow like those used by professional software developers to create code branches and commit changes (https://gitlab.nps.edu/monterey-phoenix)

Track 3 Description:
Fellows in this track will participate in the research and development of computer vision functionality for intuitive user input to the MP modeler. Fellows in Track 3 will be an embedded member of our research and agile development team, and interact closely with an experienced mentor. Depending on the fellows' interests and experience, fellows will:
- Collaborate with team members on data collection, data preparation, and data analysis, and/or
- Learn about and contribute to machine learning algorithm selection, application, and evaluation, and/or
- Partake in the design and development of a vision-based human-computer interface.

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- Experience an agile development process to include source code version control and CI/CD.

Programming and machine learning experience (or solid matrix algebra and statistics knowledge) is required for the Track 3 software development tasks (see Qualifications section). As a Track 3 fellow, your contributions to the open-source project will be publicly accessible with all due credit and attribution.

A set of part-time (20 hrs/week) and full-time (40 hrs/week) positions are available. Full-time positions have a duration of 10 weeks.

Qualifications

The Monterey Phoenix Research Participation Program at the Naval Postgraduate School is open to all students and recent graduates who meet the following qualifications:

U.S. Citizens at the time of application.
Individuals 16 years of age or older by the application deadline.
Meet one of the following conditions:
* Currently enrolled as a high school student
* Currently enrolled as an undergraduate or graduate student at an accredited institution of higher education
pursuing a degree in a science, technology, engineering or mathematics (STEM) discipline, or have interest
or experience in a STEM field.

General Qualifications for All Tracks:
- Familiarity with office automation software such as Microsoft Word, Excel, and PowerPoint.
- Able to work independently on assigned tasks in between meetings with supervisor.
- Able to work virtually from your location using online collaboration and meeting tools such as Microsoft Teams (has computer and Internet access).
- Curious, creative, and enthusiastic about learning new things and improving one's own critical thinking skills.

A cover letter expressing interest in the track(s) the applicant wishes to be considered for is requested of all applicants.

Track 2-specific Qualifications
Applicants with the following experience will be considered for Track 2:
- Fluency in C and/or Python
- Has studied compilers
- Advantageous to have written graphical user interfaces in Python
- Shows ability and interest in learning new languages

independently with few online resources available. See https://gitlab.nps.edu/monterey-phoenix/trace-generator/-/blob/master/RIGAL/Learning_RIGAL.docx for a guide to the existing resources for learning RIGAL.

A sample of code written in at least one language is requested of Track 2 applicants.

Track 3-specific Qualifications
Applicants with the following experience will be considered for Track 3:
- Strong interest in machine intelligence, in learning new software tools and working on challenging problems
- Basic knowledge of machine learning (a technical introduction course is sufficient) or, alternatively, solid knowledge of matrix algebra and statistics
- Fluency in Python or a similar modern programming language

A sample of code written in at least one language is requested of Track 3 applicants.

U.S. Veterans are encouraged to apply.

Veteran's preference will be given to U.S. military veterans who have been honorably discharged and/or have been medically discharged because of a service-connected disability and have received a degree within 3 years of the application deadline.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** High School Diploma/GED, Associate's Degree, Bachelor's Degree, Master's Degree, or Doctoral Degree received within the last 60 months or currently pursuing.
- **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 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (27 👁)
- **Age:** Must be 16 years of age
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).