

Air Force Research Laboratory Information Directorate

U.S. Department of Education Minority Science and Engineering Improvement Program (MSEIP)

2022 Summer Internships



QUESTIONS:

Please email: intern@griffissinstitute.org

Subject Line: DOE Internship Question

Griffiss institute is a contractor for AFRL.

APPLY:

Application materials should be submitted online at: [U.S. Dept. of Education/MSEIP Internship Application - 2022 AFRL/RI](https://www.ed.gov/programs/mseip/2022-summer-internship-application)

****Students may select more than one project.**

Application Deadline: Monday, March 21, 2022, 11:59 PM, EST

Program Dates:

* June 6th - August 12th, 2022 (10 weeks)

Week 1 and Week 10 are remote.

Weeks 2 – 9 are in-person.

*Exact dates may change

Expenses:

Stipends, Housing, Meal and Travel allowances supported by MSEIP grant

Eligibility:

Students must be U.S. citizens and must be enrolled in a STEM degree program in a community college or four-year university when participating the program. Students must have **3.0 or above GPA**.

Location: Rome, NY

Materials Required for a Complete Application:

1. Updated **resume** including related courses/skills as mentioned in internship project descriptions and any additional experiences that qualify you for this research internship and **official or unofficial transcripts**.
2. A **biography** which includes the following:
 - a) Description of your **skills, interests, background (career goals, coursework, and experiences)** including any hobbies.
 - b) **Identification of the ** project(s) of interest (number and name)**
 - c) Contact information for **one university references** (e.g., name, title, organization, email address, phone number)

Research Project Description:

Unity is a cross-platform game engine developed by Unity Technologies. The engine supports a variety of desktop, mobile, console and virtual reality platforms. It is particularly popular for iOS and Android mobile game development and used for games such as Pokémon Go, Monument Valley, and Call of Duty. It is easy to use for beginner developers and is popular for indie game development. The engine can be used to create three- and two-dimensional games, as well as interactive simulations.

The Air Force Research Laboratory – Information Directorate Phantom Arrow team seeks to improve scientists and engineers ability to reason about their technologies in an operational/warfighting context. The group is comprised of computer scientists, engineers, and active duty members. This group is an all-volunteer group dedicated to enhancing the Information Directorate’s ability to conceptualize, build, integrate and deliver realistic and useful applications of technology to warfighters through wargaming. To meet this goal, the Phantom Arrow group is working on a digital wargame in the Unity Game Engine. The current effort is to digitize the commercially available wargame, Persian Incursion, with the goal of modularizing its well-developed ruleset to elevate the wargame to a near-peer wargame in future iterations. Typical summer efforts have been primarily development focused and building upon the work previously completed in an agile software development style.

Qualifications of the student that will increase the likelihood of the project’s success (e.g., applicable course and lab work, research or work experience, etc.):

This project will benefit from applicants with proficiency in Unity Game Engine (preferred but not necessary), C#, Git, 3D Modeling, Software Engineering, Networking, and a Computer Science/Electrical Engineering background.

The ability and willingness to learn new programming languages will be instrumental to the success of the project.

Project Number and Name:

1. Networking/Backend Development.
2. Cyber/Economics incorporation.
3. Power Grid Concept Development.
4. Modernization to peer-to-peer conflict

Project Descriptions:

1. Networking/Backend Development:

During execution of the wargame, the three teams (white, blue, and red) sit physically separated, where the white team’s computer is a server for the red/blue clients (within a LAN). Previously, the game was using a networking library integrated with Unity; however, that library proved to be unstable, and now a new network is being built for the game. Currently, this new network has the same functionality as the previous network, but has yet to be tested over a LAN. This effort seeks to make the underlying networking more robust so that the game isn’t interrupted due to lost connections, and test its functionality over a LAN.

2. Cyber/Economics incorporation:

Our wargame of choice, Persian Incursion, currently centers around an air campaign with in a dynamic political environment. Last summer, a group of 3 Cadets from the U.S. Air Force Academy majoring in economics developed an economics component to the wargame to add this instrument of national power to the scenario. The next step is to implement this in unity for it to be a part of the digital game.

3. Power Grid Concept Development:

While Persian Incursion includes, air bases, air defense, oil infrastructure, and nuclear sites (Iranian), as part of the pivot to peer-peer competition, inclusion of a power grid would be more broadly applicable to nation-states other than Iran, and would also reflect open-source reporting of Russia’s infiltration and exploitation of the US power grid. The effort would first develop a concept of how to incorporate a power grid into the game that is representative of real life, but sufficiently abstracted from the technical details (to match the operation level of war that the game resides at), but also could include follow on software development of the concept.

4. Modernization to peer-to-peer conflict:

Persian Incursion is an Israel vs Iran scenario. The DoD is pivoting to focus on peer-competition. Therefore updating the game dynamics, as well as teams’ capabilities to reflect peer competition is the ultimate vision of the Phantom Arrow team. This effort would include both software development, but also researching peer-peer capabilities at an open-source/UNCLASSIFIED level.