Opportunity Title: GPS and Data Analyst Internship
Opportunity Reference Code: CCDC-DAC-2020-0004

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 - Click here for detailed information about acceptable transcripts
- 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 ARMY@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 Combat Capabilities Development Command (CCDC) Data & Analysis Center (DAC) is an Army Futures Command organization that conducts a variety of critical analyses to provide state-of-the-art analytical solutions to senior level Army and Department of Defense officials. The Data & Analysis Center's responsive systems analysis supports the "Equipping" and "Sustaining" of weapons and materiel for our Soldiers in the field as well as our Future Army Force. https://www.dac.ccdc.army.mil/home.html

Under the guidance of a mentor, the participant will apply mathematical, analytical and computer science principles to develop and improve modeling and simulations capabilities in the areas of Network, Positioning, Navigation, Timing (N/PNT), and Intelligence, Surveillance, and Reconnaissance (ISR) to meet needs of the Data and Analysis Center. The participant will learn the necessary technology performance data at the item level and develop methodology and computational processes to translate this data into information sets compatible with the models and tools used. He/she will gain experience in how to develop and refine methodology to properly represent the physical layers as well as the behavioral processes of the technologies; update methodologies as needed to reflect the evolving design/architecture of the Army's N/PNT/ISR capabilities and new environments of interest such as urban and foliage. In addition, the selected participant will gain experience as they assist analyses and studies by creating and tracking the task and work schedule, creating or using the proper tools, contributing to analysis tasks, developing reports and presenting briefings.

N/PNT project examples:
* Develop realistic models of direct GPS satellite acquisition for military receivers
* Assess and validate existing engineering-level models of Controlled Reception Pattern Antennas (CRPAs), and develop medium-fidelity representations for use in combat simulations
* Research different stochastic filtering approaches to determine the best navigation performance that can be obtained from commercial satellite constellations of interest
* Determine GPS system vulnerabilities and develop realistic attack methodologies and countermeasures
* Assess feasibility of using various complementary technologies to supplement GPS in hostile

environments by analytic methods and model development
* Investigate effects of different stochastic filtering architectures on navigation system performance with measurements from GPS, INS, and other complementary sensors
* Develop and test multi-path mitigation algorithms for GPS receivers using high-fidelity code tracking loop model; extend to jamming countermeasures where applicable
* Investigate applications of genetic algorithms and neural networks to optimization problems arising in communications network and navigation system modeling
* Investigate applications of quantum computing to estimation and optimization problems occurring in communications network and navigation system modeling

ISR project examples:
* Swarm UAS modeling
* Artificial Intelligence Modeling
* ISR M&S methodology development (radar, signals intelligence, electro-optical, radio frequency, infrared, etc.)
* ISR Data Development Tools (ORACLE, APEX, MATLAB, etc.)

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.

Participant Benefits

Participants will receive a stipend to be determined by CCDC Data & Analysis Center. 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.

Additional Information

While participants will not enter into an employment relationship with DOD or any other agency, this opportunity will require a suitability investigation/background investigation. Any offer made is considered tentative pending favorable outcome of the investigation. Anticipated start date is TBD.

Qualifications

This research opportunity is seeking a candidate that recently complete a bachelors degree in a STEM related field to include mathematics, engineering, statistics, physics, computer science, etc. The candidate should have experience with Microsoft applications. Experience with one or more computer programming languages (C#, VBA, C++, R, Python, etc.) and/or MATLAB is desired. Preferred course work: Linear Algebra, Probability Theory/Stochastic Processes, Digital Signal Processing, Control System Theory, Stochastic Filtering, Space-Time Adaptive Processing or

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Space-Frequency Adaptive Processing antenna design, and/or GPS receiver design.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree received within the last 60 months or currently pursuing.
- **Overall GPA:** 3.00
- **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 👁)