

Opportunity Title: Global Navigation Satellite System (GNSS) Anomaly Detection

Using Consumer Grade Hardware

Opportunity Reference Code: ICPD-2021-58

Organization Office of the Director of National Intelligence (ODNI)

Reference Code ICPD-2021-58

How to Apply **Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 2 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Additional information about the IC Postdoctoral Research Fellowship Program is available on the program website located at: <https://orise.orau.gov/icpostdoc/index.html>.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 2/26/2021 6:00:00 PM Eastern Time Zone

Description **Research Topic Description, including Problem Statement:**

Global Navigation Satellite System (GNSS) anomaly detection can normally only be done using dedicated expensive hardware. Modern GNSS receiver hardware is able to cope with multiple GNSS constellations and has improvements in RF performance that help reject interference to some extent. There is a significant vulnerability to cyberattack because of the growing ubiquitous use of consumer grade hardware in critical systems. This research will investigate whether simple machine learning (ML) algorithms can be used to detect anomalous GNSS signals by modeling the behavior of consumer-grade GNSS hardware when under duress from rogue signals. The outcome should be a low-cost sensor, based on consumer-grade hardware, for detecting anomalous GNSS that can be widely deployed for protective security.

Example Approaches:

Behavioral modeling of the status and the output of consumer-grade GNSS receiver hardware to detect the circumstances of divergence from expected conditions.

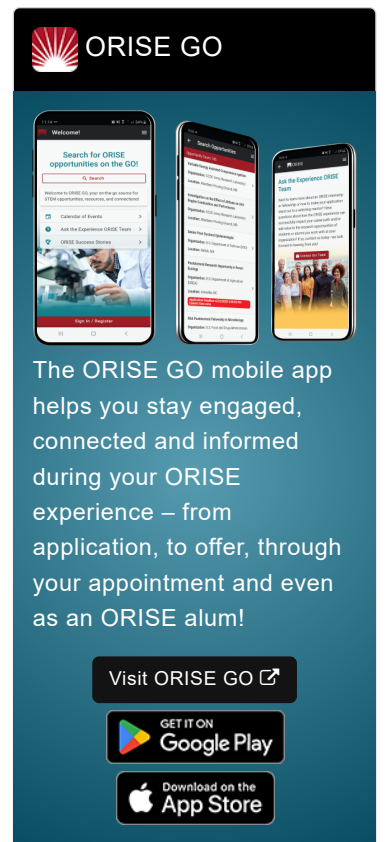
Relevance to the Intelligence Community:

The Intelligence Community has a growing interest in low-cost wireless and environmental sensing devices that can be used as a convenient platform and infrastructure for protective environmental surveillance, without additional significant costs. GNSS sensing could be added to our designs.

Key Words: GNSS, Hardware, Radio Frequency, RF, Cybersecurity, Machine Learning, ML, Security


Qualifications **Postdoc Eligibility**


- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five years of the application deadline
- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory




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- Eligible candidates may only receive one award from the IC Postdoctoral Research Fellowship Program

Research Advisor Eligibility

- Must be an employee of an accredited U.S. university, college or U.S. government laboratory
- Are not required to be U.S. citizens

**Eligibility
Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **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](#))