Opportunity Title: Simulation of Emerging Sensor Technologies Fellowship
Opportunity Reference Code: ICPD-2024-47

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	ICPD-2024-47
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 3 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** | 2/28/2024 6:00:00 PM Eastern Time Zone |
| **Description** | **Research Topic Description, including Problem Statement:**

Scientific and engineering advances in areas such as quantum, photonic and manufacturing techniques are creating opportunities for the development of new types of sensors which may create as-yet unquantified opportunities (and threats) for the IC trying to operate in environments where currents sensors are ineffective.
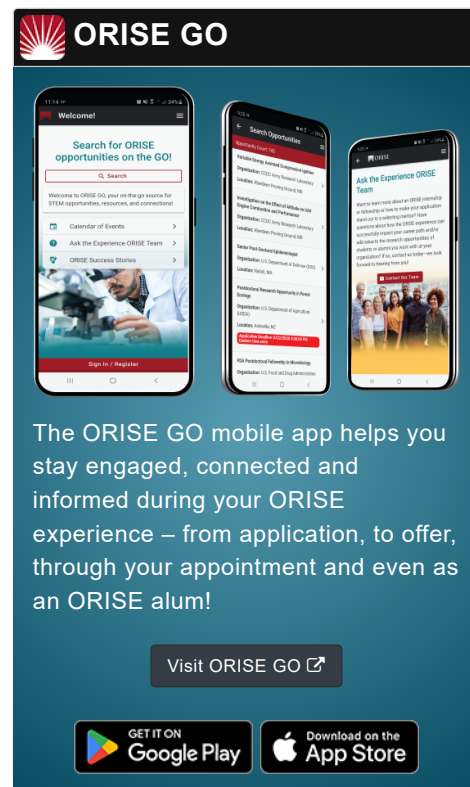
For most use cases traditional methods of gathering environmental data from the commercial world are very mature, such as light (imagery/photos/video), pressure (audio), magnetics (object detection), RF, and motion (accelerometers and gyros). Capability upgrades are mostly in the processing of the output, not the sensing itself.

There are however still several areas where current sensors fail to gather useful information:

- Non-illuminated ultra-low light imaging.
- Speech detection in high noise, highly reverberant environments.
- Position in GNSS-denied environments.

The aim of this research topic is to investigate the use of simulated environments to quantify/qualify the effectiveness of novel sensing methods in environments where current sensors are ineffective.

Example Approaches: |

Opportunity Title: Simulation of Emerging Sensor Technologies Fellowship
Opportunity Reference Code: ICPD-2024-47

- Create a scenario within a simulated environment, model novel sensor techniques and quantify.
- Using information on novel sensors that can detect faint objects or detect without the photons even hitting the object.
- Gravimetry sensors used to passively detect objects underground.
- Increase sensitivity of GPS receivers.

We are not overly prescriptive as regards solutions; all techniques are welcome. We are, however, looking for methods which could be practically used as technique matures.

Key Words: Edge, IoT, Cloud, Compute, Neural Networks, post-CMOS, Machine Learning, Cybersecurity, green AI, Sensors, Emerging technologies, Simulated environments, Modelling, Imagery, Audio, Magnetic, RF, Motion, Quantum sensors.

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 appointment start date
- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- 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** (3 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (45 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Other Non-Science & Engineering** (2 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (30 👁)