Opportunity Title: Task Allocation and Planning in Multi-Robotic Systems: Balancing Task Completion Time and Geospatial Information Gain
Opportunity Reference Code: ICPD-2023-10

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	ICPD-2023-10
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.**

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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.

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Application Deadline	2/28/2023 6:00:00 PM Eastern Time Zone
Description	**Research Topic Description, including Problem Statement:**

With the advances in unmanned aerial system (UAS) there have been increasing research in development of algorithms for tasking multi-robotic systems (MRS) to explore, map, and navigate the environment. Many of these techniques have focused on homogenous MRS – wherein all units of the MRS possess similar characteristics and capabilities. Unmanned ground systems have simultaneously emerged and present new opportunities to leverage diverse sensor arrays and perspectives (aerial versus oblique). However, additional research is required to develop algorithms that can maximize the completion time of a geospatial task, such as mapping an environment after a natural disaster, that also balances the unique information gains from diverse view angles. Advances in tasking algorithms for these heterogenous multi-robotic systems would advance the acquisition of GEOINT in mix-use environments.

Example Approaches:

Develop algorithm or train machine learning approach using a three-dimensional synthetic geospatial environment, such as an urban setting, with virtual agents representing a combination of aerial and ground based autonomous vehicles tasked with mapping the environment in 3D.

**Relevance to the Intelligence Community (IC):**

- Aid the development/enhancement computational methods for analysis of geospatial information to detect anomalies.
- further the development/enhance means to periodically search broad regions for specific but low signals.

Key Words: Robotics, AI, Swarm, Multi-robotic Systems, Autonomous Mapping and Navigation

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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
- 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** (4 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (48 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Other Non-Science & Engineering** (2 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (29 👁)