Opportunity Title: Enhanced Computational Modeling of Human Navigation in Urbanized Environments Fellowship
Opportunity Reference Code: ICPD-2024-05

Organization Office of the Director of National Intelligence (ODNI)

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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:

An extensive body of work has sought to model the navigational modalities of human beings in urbanized environments by leveraging agent-based computational modeling (ABM) techniques. However, this literature has assumed simple travel distance cost-optimization strategies, encoded in the decision-rules followed by individual model agents (cf. the canonical Dijkstra algorithm). Recent, groundbreaking research leveraging anonymized en masse data collection has revealed that human beings rather employ more complex decision-rules in their navigational choices.

This project seeks to address the problem: how can we more accurately model human navigation to better inform large-scale models of human mobility in urbanized environments? The project will support development of novel computational approaches that more accurately reproduce real-world navigational choices now revealed in empirical data. Candidates for consideration will demonstrate deep competence in large-scale modeling of human mobility in urbanized environments, leveraging advanced computational techniques.

Example Approaches:

Empirically-informed large-scale agent-based computational modeling of human mobility in urbanized environments, leveraging research-grade high-performance computing resources for model development, testing and evaluation.

Relevance to the Intelligence Community:

DNI Priority 4: Promoting expertise, data, science, and innovation. Drawing on external and internal expertise, developing new expertise, consistently promoting knowledge as a resource and underlying on evidence-driven insights to innovate.

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IC STG Goal 4: Create the Future Operational Landscape. Find, create, and deploy scientific discoveries and new technologies, nurturing innovative thought, advancing tradecraft, and improving mission and business processes.

Identified IC S&T Needs addressed by the proposed work are:

- Develop/enhance theoretical concepts related to activity-based intelligence.
- Develop/enhance computational methods for analysis of geospatial information to detect anomalies.
- Develop/enhance computational methods related to the interdisciplinary field of human geography for discovery of complex patterns and processes.
- Develop/enhance capabilities to flag anomalies within massive data sets.

Key Words: human mobility, human navigation, human trajectory analysis, agent-based modeling.

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** (4)
  - **Computer, Information, and Data Sciences** (17)
  - **Earth and Geosciences** (21)
  - **Engineering** (27)
  - **Environmental and Marine Sciences** (14)
  - **Life Health and Medical Sciences** (46)
  - **Mathematics and Statistics** (11)
  - **Other Non-Science & Engineering** (2)
  - **Physics** (16)
  - **Science & Engineering-related** (1)
  - **Social and Behavioral Sciences** (30)