

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)

Reference Code ICPD-2024-05

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:

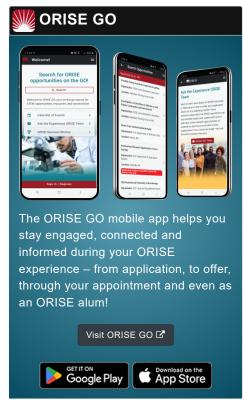
An extensive body of work has sought to model the navigational modalities of human beings in urbanized environments by leveraging agent-based computational modeling (ABM) techniques. However, this literature has assumed simple travel distance cost-optimization strategies, encoded in the decision-rules 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.





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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.

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 activitybased 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 ⑤)
 - Communications and Graphics Design (4 ●)
 - Computer, Information, and Data Sciences (17
 - Earth and Geosciences (21
 - Engineering (27 ●)

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- ∘ Environmental and Marine Sciences (14 ●)
- Life Health and Medical Sciences (46 ●)
- o Mathematics and Statistics (11 ●)
- Other Non-Science & Engineering (2 ●)
- Physics (16 ●)
- Science & Engineering-related (1 ●)
- Social and Behavioral Sciences (30 ●)

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