Opportunity Title: Uncovering Insights into Locations Using Geosocial Data
Opportunity Reference Code: ICPD-2022-21

Organization Office of the Director of National Intelligence (ODNI)

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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.

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 2/28/2022 6:00:00 PM Eastern Time Zone

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

The fusion of GPS-equipped mobile devices with online social networking platforms has given rise to location-based social networks (LBSNs). These networks allow users to share their location, activities, and thoughts in real-time. This is a rich and largely untapped source of data that has several application domains with potential for solving a range of crucial problems. In particular, this data provides opportunities for research into three main aspects of human mobility:geographic movement (locations visited), temporal dynamics (periodicity of movement), and social networks (evolution of relationships). An analysis of all these aspects may provide interesting societal patterns as well as insights into how spaces are used and evolve over time. The purpose of this research is to develop techniques to accurately label location usage and building types leveraging only geosocial data derived from LBSNs. Potential other areas of exploration include developing predictive methods of geographic movement by leveraging historical regional geosocial data.

Example Approaches:

The proposed research should seek to identify location usage and building types through the lens of geosocial data derived from LBSNs. Applicants are encouraged to explore diverse methodologies that draw upon different areas of data science and data mining including machine learning, natural language processing, and graph theory. The approach should allow for the incorporation of LBSN data from multiple platforms.

Relevance to the Intelligence Community:

Manual identification and labeling of dense geographic areas with different points of interest is a time-consuming task that often requires deep knowledge of the region. The ability to leverage geosocial data to gain key

insights into what truly are the points of interest to inhabitants of a region is beneficial to the Intelligence Community. Given that space usage can rapidly be repurposed (e.g. during natural disasters), the ability to flag these changes would provide valuable insight and assist with strategic planning.

Key Words: Data Mining, LBSN, Location-Based Social Networks, Geosocial Patterns, GPS, NLP, Natural Language Processing, Social Media, Geotagging, Machine Learning, Artificial Intelligence, ML, AI

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** (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 👁)