Opportunity Title: Strengths and weaknesses of social network analysis
Opportunity Reference Code: IC-18-14

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	IC-18-14
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.**

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://orau.org/icpostdoc/.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline	3/12/2018 11:59:00 PM Eastern Time Zone
Description	**Research Topic Description, including Problem Statement:**

A growing number of scholars and practitioners use a set of quantitative methods called social network analysis (SNA) to characterize business, criminal, and terrorist organizations and produce valuable insights into their operational dynamics. The successful conduct of SNA requires data that informs the links or relationships between pairs of individuals within a group and the calculation of various metrics that measure node centrality and network dynamics. Further research on SNA, however, is necessary to identify the benefits and pitfalls of SNA: under which conditions do the measures of node centrality and network dynamics are informative or fail and which choices of data most accurately inform us about the networks under study.

Example Approaches:

- Are there novel SNA metrics or data types useful for studying networks engaged in illicit activities such as human trafficking, terrorism, organized crime, drugs, or weapons proliferation?

- How accurate are SNA metrics, or changes in SNA metrics, at predicting behavior of leaders within a network or predicting new leadership during turn overs?
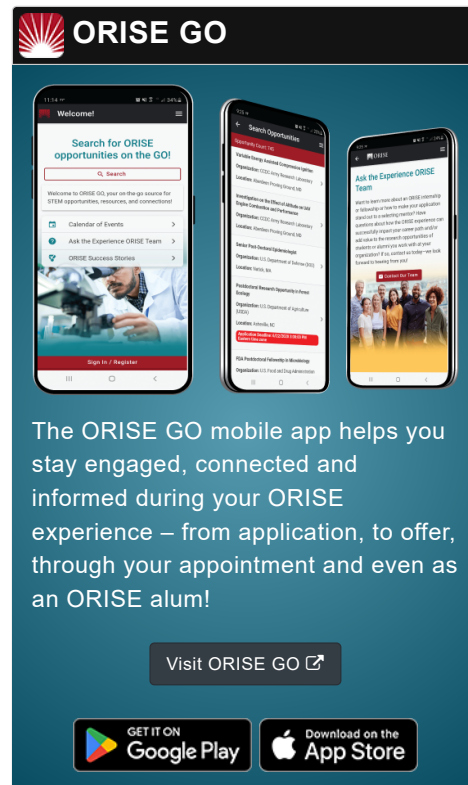
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- As networks expand to an unmanageable size, what data reduction methods ensure that key nodes remain in the graph and SNA metrics remain reliable?

- Using a variety of existing collected data on a particular network, which single set of data best represents nodes within the network and the network's dynamics when compared with a qualitative assessment? Are there subsets of data, when combined, which represent the network well?

- Which types of relationship data are most sensitive to missing data points and which types of data are most resilient?

- Using existing data from a fully mapped network as a "gold standard" or "ground truth" case study (e.g., ENRON case), how much information can be randomly removed from the network before eigenvector, closeness, betweenness, and other SNA metrics become misleading?

- Which SNA metrics are most sensitive to missing data and what techniques might help mitigate these sensitivities?

- Which node attributes are most sensitive to missing data and what techniques might help mitigate these sensitivities?

- How transferrable are SNA techniques between different networks?

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** (6 👁)
  - **Computer, Information, and Data Sciences** (16 👁)

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- **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** (5 👁)
- **Physics** (16 👁)
- **Science & Engineering-related** (1 👁)
- **Social and Behavioral Sciences** (28 👁)