Opportunity Title: Behavioral Analytics
Opportunity Reference Code: IC-16-49

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	IC-16-49
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.
Application Deadline	4/15/2016 6:00:00 PM Eastern Time Zone
Description	The principal aim of the research is to investigate how inferences about human behavior associated with threat actors can be made on the basis of multimedia content, i.e. text documents, still images, video and audio tracks. The use of the inferences would be for prioritization of data sources. Behavioral analysis is hard because it combines classification of human behavior with large heterogeneous data sets. There has been a significant amount of research undertaken already in universities and by large corporations, but remains an active area for research and for the techniques of data science and behavioral science in particular. The research could build on existing published research on the following areas: • Machine learning (supervised and unsupervised classification techniques) • Probabilistic inference techniques (Bayesian networks) • Text analytics • Image analytics (object recognition and classification) • Video analytics (object recognition, classification and tracking) • Data fusion and link analysis There is a dependency on existing taxonomies of human behavior, but human subject research is not in scope of this topic. There are also some ground-truthed video data sets, such as the University of Edinburgh's BEHAVE data set. **Example Approaches:** The research could build on published studies and existing research, but is likely to be multi-disciplinary as identification and classification of objects applies within the same medium and

Opportunity Title: Behavioral Analytics
Opportunity Reference Code: IC-16-49

identifiers need to be performed across media types. Models of behavior could be created to test object classification and correlation between objects identified in different media types. Machine learning approaches that could be used for classification and correlation are neural networks, topic modeling, regression and mixture models (including source vector machines). Taxonomies of threat behaviors could be tailored from existing studies in behavioral science, but there is no requirement for humans to be involved in any experiments. Novel approaches such as crowd-sourcing for classification would be considered.

Specific research questions to be answered are:

- Is there a set of optimal machine learning algorithms that can classify human behavior based on multimedia sources in an efficient way?
- Is there a set of optimal machine learning algorithms that can make inferences about human behavior based on multimedia sources in an efficient way?
- Is it possible to infer new threat types on the basis of observed behaviors in an efficient way?
- Are there any promising non-machine learning approaches to behavioral analytics?
- Can repeated observable behaviors be reliably classified in and across media types?

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Business** (11 👁)
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (6 👁)
  - **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** (13 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (28 👁)