Opportunity Title: Opportunities and risks in the application of machine and deep learning to security screening
Opportunity Reference Code: ICPD-2019-24

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 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://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 3/1/2019 6:00:00 PM Eastern Time Zone

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

- Research into the use of machine learning and deep learning as a means of automating aspects of the security screening process is increasing, particularly as applied to automated detection algorithms applied to interpretation of imaging data produced by aviation security screening systems. This brings with it undoubted opportunities to reduce the level of human effort required in the screening process, alongside potential improvements in levels of security. However, there are also risks in the early adoption of a rapidly evolving area of technology without full consideration of potential vulnerabilities, including how the effectiveness of systems can be rigorously quality assured both prior to deployment and throughout their lifecycle.
- An understanding of both the opportunities associated with the operational deployment of automated detection algorithms based on machine learning and deep learning techniques, balanced against the potential drawbacks and costs will be crucial to ensure that the most benefit can be derived from this technology.

Example Approaches:

- A study into potential vulnerabilities from the use of machine learning or deep learning approaches as applied to security screening applications, such as automated threat detection in X-ray images or millimetre-wave people-screening data.
- An evaluation of the best way to integrate automated machine learning and deep learning decision making with human interpretation, and the implications on human performance.
- An exploration of the public perception of the increasing use of automated decision-making in security screening, particularly through machine learning and deep learning.

Key Words:

Deep learning; machine learning; security screening; artificial intelligence

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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)
  - **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)