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Opportunity Title: Development and Evaluation of Statistical Models to Support the Genotyping of any Organism to Forensic Standards
Opportunity Reference Code: ICPD-2023-05

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	ICPD-2023-05
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 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	2/28/2023 6:00:00 PM Eastern Time Zone
Description	**Research Topic Description, including Problem Statement:**

Determining the genotype of an organism is a foundational step in forensic analysis necessary to support identification, higher-level classification, assessment of relationships among related organisms, and a multitude of other applications. At present, genotyping systems are highly specific to particular biotechnologies, application areas, and organismal domains; this in turn demands that forensic practitioners become subject matter experts in potentially many scientific disciplines to be able to interpret genomic data to a standard that will be defensible in a court of law. The aim of this research topic is to develop a statistical framework to support the genotyping of any organism, independent of the technology used to generate the genomic data and the analytical software that would produce a candidate genotype, which would serve to increase the interpretability of a large range of downstream applications.

Example Approaches:

The statistical models, which could include AI/ML models, will need to accommodate many aspects of genomic heterogeneity and will also need to account for missing data, as incomplete profiles are frequently generated in forensic analysis due to limited or degraded sample material. Successful outcomes will include the publication of the statistical framework, demonstrations of its utility on real genomic data of consequence, and eventually guidelines and best practices for its use by operational forensic laboratories.

Relevance to the Intelligence Community (IC):

This Postdoctoral effort will support the development of a statistical framework needed to standardize the genotyping of genomic data and the assignment of associated statistical confidence values to better inform intel

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analysis by policy makers. This appointment will focus on the development of mathematical models to support the analysis of complex biological samples potentially containing both haploid (bacterial and viral) organisms and organisms with diploid or higher ploidy genomes.

Key Words: #Statistical Models, #Artificial Intelligence (AI) #Machine Learning (ML), #Genotyping, #Genomics, #Forensics

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** (3 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (48 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Other Non-Science & Engineering** (2 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (27 👁)