Opportunity Title: Game Theory and Machine Learning for Cyber Deception
Opportunity Reference Code: ARL-C-CISD-300161-NCCS

Organization	DEVCOM Army Research Laboratory
Reference Code	ARL-C-CISD-300161-NCCS
Description	**About the Research**

This research opportunity is to develop novel methods for cyber deception. The candidate will be responsible for leading the design, development, publication, and prototyping of novel adaptive, proactive, and reactive cyber deception systems to ensure authentic, accurate, secure, and reliable communication networks. The developed models should focus on the generation, deployment, design, and reconfiguration of decoy devices such as honeypots, honeynets, honey-tokens, etc. Algorithms should apply to complex adversarial decision-making based on game theory, reinforcement learning, and utilizing state-of-the-art AI algorithms to dynamically adapt to, and learn from human or agent actions and contextual situations and adversarial environments.

The ideal candidate will be interested in developing novel AI algorithms and decision theories based on cross-disciplinary approaches. This role requires experience in Game Theory, Multi-agent Reinforcement Learning, and Machine Learning.

Keywords: game theory, machine learning, artificial intelligence, cyber security, cyber deception

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About Network Cyber & Computational Sciences (NCCS)
Sciences to enable and ensure secure resilient communication networks for distributed analytics in Multi-Domain Operations

**About DEVCOM Army Research Laboratory (ARL) Research Associateship Program (RAP)**
The [Army Research Laboratory Research Associateship Program](#) (ARL-RAP) is designed to significantly increase the involvement of creative and highly trained scientists and engineers from academia and industry in scientific and technical areas of interest and relevance to the Army. Scientists and Engineers at the CCDC Army Research Laboratory (ARL) help shape and execute the Army's program for meeting the challenge of developing technologies that will support Army forces in meeting future operational needs by pursuing scientific research and technological developments in diverse fields such as: applied mathematics, atmospheric characterization, simulation and human modeling, digital/optical signal processing, nanotechnology, material science and technology, multifunctional technology, combustion processes, propulsion and flight physics, communication and networking, and computational and information sciences.

About DEVCOM Army Research Directorate (ARD)
ARL's Army Research Directorate (ARD) focuses on exploiting concept development, discovery, technology development, and transition of the
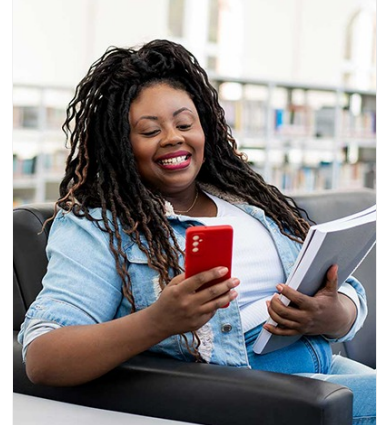
most promising disruptive science and technology to deliver to the Army fundamentally advantageous science-based capabilities through laboratory's 11 research competencies. This intramural research directorate also manages the laboratory's essential research programs, which are flagship research efforts focused on delivering defined outcomes.

A complete application includes:

- **Curriculum Vitae or Resume**
- **Three References Forms**
  - An email with a link to the reference form will be available in Zintellect to the applicant upon completion of the on-line application. Please send this email to persons you have selected to complete a reference.
  - References should be from persons familiar with your educational and professional qualifications (include your thesis or dissertation advisor, if applicable)
- **Transcripts**
  - Transcript verifying receipt of degree must be submitted with the application. Student/unofficial copy is acceptable

If selected by an advisor the participant will also be required to write a **research proposal** to submit to the ARL-RAP review panel for :

- Research topic should relate to a specific opportunity at ARL
- The objective of the research topic should be clear and have a defined outcome
- Explain the direction you plan to pursue
- Include expected period for completing the study
- Include a brief background such as preparation and motivation for the research
- References of published efforts may be used to improve the proposal

A link to upload the proposal will be provided to the applicant once the advisor has made their selection.

Questions about this opportunity? Please email
ARLFellowship@orau.org.

Eligibility Requirements

- **Degree:** Master's Degree or Doctoral Degree.
- **Academic Level(s):** Master's Degree (Journeyman Fellow), Master's Degree 7+ years (Senior Fellow), or Doctoral Degree (Postdoctoral Fellow).
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Engineering** (27 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Physics** (16 👁)