

Opportunity Title: Limbed Robotics: Dynamic Whole-Body Mobility and Manipulation

Opportunity Reference Code: ARL-R-SIS-400042-F1

Organization DEVCOM Army Research Laboratory

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Description Organization

DEVCOM Army Research Laboratory (ARL)

About the Work

ARL is pursuing research to increase dynamic mobility and manipulation capabilities of autonomous limbed robots. The goal is to facilitate robust autonomous behaviors for agile traversal and manipulation in complex environments. Physics-based, multi-bodied models are used to construct simulations that aid the development of control authorities and fundamental understanding of the dynamics that govern the robotic system. Behavior development can be model-based, leverage machine learning tools, or combine approaches. Behaviors are transitioned to physical platforms for verification and tuning. Iterations between the simulation and physical platform expand and improve performance and efficiency. These techniques are used across multiple platforms, including wheeled, aerial, quadrupedal, and bipedal systems with or without manipulators. Investigating other forms of unique mobility and manipulation is also possible. Candidates should be aware of techniques for validation and verification of simulations through experiments.

ARL Advisors: Jason Pusey, jason.l.pusey.civ@army.mil; Chad Kessens, chad.c.kessens.civ@army.mil

About SISD

The DEVCOM Army Research Laboratory's Science of Intelligent Systems Division (SISD) is the principal Army organization responsible for basic research in embodied autonomy science and technologies, leading to advanced capabilities and improved reliability for future Army air and ground vehicles. SISD's mission is accomplished through in-house basic and applied research, and from collaborations with other Army organizations inside and outside Army Futures Command, as well as Navy, Air Force, Academia and Industry. The mission is enhanced through teaming with and leveraging outside research efforts, such as those associated with Collaborative Research Alliances (CRAs) and Multidisciplinary University Research Initiatives (MURIs).

About ARL-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.



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Scientists and Engineers at the DEVCOM Army Research Laboratory help shape and execute the Army's program for 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, mechanical and electrical engineering, artificial intelligence, machine learning, and computational and information sciences.

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. A student/unofficial copy is acceptable.

Questions about this opportunity? Please email

ARLFellowship@orau.org

Eligibility Requirements

- **Citizenship:** U.S. Citizens Strongly Preferred
- **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree.
- **Discipline(s):**
 - **Computer, Information, and Data Sciences**
 - **Engineering**
 - **Mathematics and Statistics**
 - **Physics**
 - **Science & Engineering-related**
 - **Chemistry and Materials Sciences**
- **Age:** Must be at least 18 years of age

Point of Contact [ARL](#)

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|---------------------------------|---|
| Eligibility Requirements | <ul style="list-style-type: none">• Degree: Bachelor's Degree, Master's Degree, or Doctoral Degree.• Academic Level(s): Bachelor's Degree (Journeyman Fellow), Master's Degree (Journeyman Fellow), Master's Degree 7+ years (Senior Fellow), Doctoral Degree (Postdoctoral Fellow), Doctoral Degree 5+ years (Senior Fellow), or Faculty. |
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- **Discipline(s):**

- **Chemistry and Materials Sciences** ([12](#))
- **Communications and Graphics Design** ([2](#))
- **Computer, Information, and Data Sciences** ([17](#))
- **Earth and Geosciences** ([21](#))
- **Engineering** ([27](#))
- **Environmental and Marine Sciences** ([14](#))
- **Life Health and Medical Sciences** ([51](#))
- **Mathematics and Statistics** ([11](#))
- **Physics** ([16](#))
- **Science & Engineering-related** ([2](#))
- **Social and Behavioral Sciences** ([29](#))