

**Opportunity Title:** Control of Structurally Adaptive Small Unmanned Aerial Systems

**Opportunity Reference Code:** ARL-R-WMRD-300147

**Organization** DEVCOM Army Research Laboratory

**Reference Code** ARL-R-WMRD-300147

**Description About the Research**

In the space of Army small unmanned aerial systems (UAS) increasing complex and atypical vehicle designs are being sought to create new modalities of maneuver that will allow for flight through congested environments low to the ground. Compliant and/or adaptive structures are needed for complex behaviors such as high-speed object avoidance, perching, soaring etc. These structures and their associated aerodynamics have created a need for controls expertise in applying software for the stability of dynamic aircraft. The end goal for this position will be the flight demonstration of unique small UAS behaviors where the UAS is performing maneuvers that typically are not possible and/or are un-automated.

This position requires expertise in transitioning theoretical or simulation based controllers to experimental hardware platforms (quad-copter, fixed wing, or hybrid experimentally developed). Ideally, candidates would be comfortable working in C++, python or similar programming languages. The specific structural effectors for aerodynamic control will typically be custom built with input from this position as well as commercial off the shelf components. The development of real-time dynamics models that describe these aircraft will be needed to provide for flight demonstration.

*ARL Advisor:* Dr. Todd C. Henry

*ARL Advisor Email:* [todd.c.henry2.civ@army.mil](mailto:todd.c.henry2.civ@army.mil)

**About WMRD**

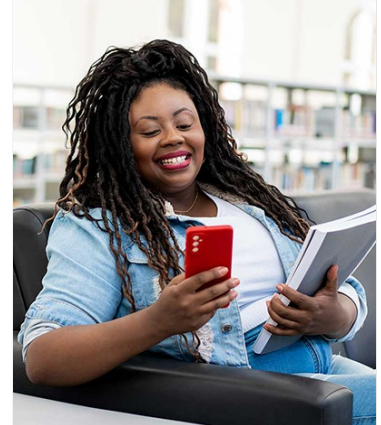
The goals of the Weapons and Materials Research Directorate (WMRD) are to enhance the lethality and survivability of weapons systems, and to meet the soldier's technology needs for advanced weaponry and protection. Research is pursued in energetic materials dynamics, propulsion/flight physics, projectile warhead mechanics, terminal effects phenomena, armor/survivability technologies, environmental chemistry, and advanced materials (energetic, metals, ceramics, polymers, composite/hybrids, and mechanics) for armor, armament, missiles, ground vehicles, helicopters, and individual soldier applications necessary for maintaining and ensuring supremacy in future land warfare.

**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. 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



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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.

**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 (see [Research Areas](#))
- 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](mailto:ARLFellowship@orau.org).

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| <b>Eligibility Requirements</b> | <ul style="list-style-type: none"><li>• <b>Degree:</b> Doctoral Degree received within the last 60 month(s).</li><li>• <b>Academic Level(s):</b> Any academic level.</li><li>• <b>Discipline(s):</b><ul style="list-style-type: none"><li>◦ <b>Engineering</b> (<a href="#">2</a> )</li></ul></li></ul> |
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