Opportunity Title: Advanced Algorithm Development for Guidance, Navigation, and Control for Spacecraft
Opportunity Reference Code: AFSTFP-AFRL-2018-B8481

Organization U.S. Air Force

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How to Apply A complete application package consists of:

- An application
- A current resume/CV
- Transcript(s) – For this opportunity, an unofficial transcript or copy of academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. **Official Transcripts for Junior applicants must be sent to ORAU directly from the academic institution, including graduation date and degree awarded, and must be provided before the fellowship can begin.** All transcripts must be in English or include an official English translation.
- Three references

Additional documents to be uploaded must be in PDF format in a standard typeface no smaller than 12-point font, 1" margins, and double-spaced.

- Research Proposal (maximum of 10 pages)
- Dissertation Abstract (maximum of 1 page) *not required for Senior applicants*
- Summary of Previous and Current Research (maximum of 4 pages)
- List of Publications (maximum of 2 pages)

If you have questions, send an email to AirForceFellowships@orau.org. Please include the reference code for this opportunity in your email.

Description This project seeks to develop new methods, techniques, and algorithms for challenging spacecraft guidance, navigation, and control (GNC) problems. Specifically, this topic seeks to (1) develop improved guidance and control algorithms that provide improved robustness and performance in the face of systemic uncertainties (e.g., modeling errors), are adaptive to such errors to enable performance in spite of errors, provide solutions for mission assurance and mission safety (e.g., fail-safe qualities), enable efficient use of spacecraft resources (fuel, power, etc.), and are reconfigurable based on shifting mission priorities; and (2) develop improved estimation algorithms for relative and inertial navigation that process alternative signals and measurements onboard the spacecraft such that accurate and robust navigation solutions under system uncertainties are guaranteed. Research proposals that address one or more of these topics from a theoretical or experimental point of view are of interest. This research can use the experimental facilities at AFRL, including a spherical air bearing attitude control and determination testbed, image-based spacecraft navigation facilities, rendezvous & proximity operations simulation capabilities, and autonomous multi-spacecraft testbeds.

Research Advisor

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Prospective applicants are encouraged to contact the opportunity's Research Adviser, listed below, to discuss the applicant's approach for responding to this research opportunity and to discuss their potential collaboration on the research opportunity.

Dr. Morgan C. Baldwin, morgan.baldwin@us.af.mil, (505) 846-9600

Qualifications

Candidates must have a Ph.D., Sc.D., M.D., D.V.M., or academically equivalent research doctorate before beginning the fellowship.

Candidates must have U.S. citizenship. Research opportunities at AFRL, AFIT, and USAFA are open to U.S. citizens only. Qualified applicants will receive consideration without regard to race, creed, color, age, sex, or national origin.

Stipend rates are determined by Air Force officials, and are based on the applicant's academic and professional background. The fellow must show proof of health and medical insurance. Health insurance can be obtained through ORAU. The fellow will not enter into an employee/employer relationship with ORAU, USAF, or any other facility, office or agency. Instead, the participant will be affiliated with ORAU for the administration of the appointment through the ORAU appointment letter and Terms of Appointment.

For more information, please visit the Air Force STFP website at https://AirForceFellowships.orau.org.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12)
  - **Computer, Information, and Data Sciences** (16)
  - **Earth and Geosciences** (21)
  - **Engineering** (27)
  - **Environmental and Marine Sciences** (12)
  - **Life Health and Medical Sciences** (45)
  - **Mathematics and Statistics** (10)
  - **Other Non-Science & Engineering** (2)
  - **Physics** (16)
  - **Science & Engineering-related** (1)
  - **Social and Behavioral Sciences** (18)