

Faculty Member Contact Information

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| Contact Info | |
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| Campus Box | 1805 |
| Department | Mechanical and Mechatronics |

1 Unfunded URCA Assistant(s)

Are you willing to work with students from outside of your discipline? If yes, which other disciplines?

- Yes

How many hours per week will your student(s) be required to work in this position?
(Minimum is 6 hours per week; typical is 9)

- 8

Will it be possible for your student(s) to earn course credit?

- No

Location of research/creative activities:

- School of Engineering - Rm1082

Brief description of the nature of the research/creative activity?

- A recent senior design team developed and constructed a mechanical system capable of adjusting the angle of airplane wings within the School of Engineering wind tunnel. This system enables precise control of the wing's angle of attack, which is critical for aerodynamic testing and analysis.
- To enhance the functionality of this setup, a graphical user interface (GUI) is required to allow users to control the system from a computer. The proposed solution involves integrating an Arduino-based control system with LabVIEW for instrument control and data acquisition.
- The Arduino will interface with the mechanical components, such as motors and position sensors, to control and monitor the wing angle. LabVIEW will serve as the front-end

interface, allowing users to input desired angles, monitor real-time system feedback, and record experimental data.

- This integration will provide a user-friendly and efficient platform for conducting wind tunnel experiments, enabling precise control, real-time visualization, and data logging for further analysis.

Brief description of student responsibilities?

- This project requires developing proficiency in stepper motor control, microcontroller programming, data acquisition techniques, and the use of LabVIEW for both instrument control and graphical user interface (GUI) design.

URCA Assistant positions are designed to provide students with *research or creative activities* experience. As such, there should be measurable, appropriate outcome goals.

What exactly should your student(s) have learned by the end of this experience?

- How to communicate with end-users.
- Data acquisition and GUI design
- Labview and National Instrument software use.
- Stepper motor, limit switch and Arduino control.

Requirements of Students

If the position(s) require students to be available at certain times each week (as opposed to them being able to set their own hours) please indicate all required days and times:

- N/A

If the location of the research/creative activities involves off campus work, must students provide their own transportation?

- N/A

Must students have taken any prerequisite classes? Please list classes and preferred grades:

- N/A

Other requirements or notes to applicants: