

Faculty Member Contact Information

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Contact Info	
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Department	Industrial Engineering

1 Funded, 2 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)

- 9

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

- No

Location of research/creative activities:

- Campus/remote

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

- In this project, we will design and build an interactive virtual manufacturing environment that can be used with virtual reality (VR) headsets. The goal is to create an immersive learning tool that helps undergraduate students understand manufacturing processes in a realistic and engaging way.
- Students working on this project will be involved in several stages of designing the VR learning environment. This includes:
- Analyzing real manufacturing processes to determine what should be modeled in the virtual world (for example: machining, assembly, quality inspection, material handling).
- Creating 3D models of equipment, workstations, tools, and factory layouts using computer-aided design (CAD) or 3D modeling software.

- Developing interactive VR simulations using game-engine platforms such as Unity or Unreal Engine.
- Programming user interactions so students can walk around the virtual facility, operate machines, observe processes, or complete tasks.
- Testing and refining the VR experience based on student feedback to make the environment intuitive, educational, and realistic.
- Documenting the design process and collecting user-study data to evaluate how VR can improve manufacturing education.
- Students will gain hands-on experience with VR technology, digital modeling, and simulation development. They will also learn about ergonomics, safety, workflow design, and other important topics in industrial and manufacturing engineering. By the end of the project, students will contribute to a functional VR learning tool that can be used in the Industrial Engineering curriculum at SIUE.

Brief description of student responsibilities?

- As a URCA Assistant on this project, the student will actively participate in the design and development of a virtual manufacturing environment intended for educational use. The following responsibilities describe what the student is expected to do throughout the project:
- Review Background Material:
- Become familiar with basic manufacturing processes, workflows, safety principles, and VR development concepts. This may include reading assigned materials or exploring example VR applications.
- Assist with 3D Modeling:
- Use CAD or 3D modeling software to help create digital models of machines, tools, workstations, and other elements of the virtual manufacturing environment. The student will learn how to prepare models so they can be imported into a VR platform.
- Support VR Environment Development:
- Work in Unity, Unreal Engine, or another development platform to place 3D models, adjust layouts, and help build interactive scenes. This may include scripting simple actions or helping to debug technical issues.
- Participate in Design Decisions:
- Meet regularly with the faculty mentor to discuss design choices, user-interaction ideas, learning objectives, and improvements to the VR environment. The student will be encouraged to offer creative input and propose solutions.
- Testing and Documentation:
- Test the VR environment for usability, accuracy, and educational value. The student will document observations, record issues, and suggest refinements.
- Prepare Materials for Evaluation:

- Assist with preparing instructions, screenshots, or demonstration videos that will help other students or faculty use the VR system. The student may also help organize user-testing sessions with classmates.
- Attend Weekly Meetings:
- Meet weekly with the faculty mentor to discuss progress, challenges, and next steps. The student will be expected to manage their time responsibly and maintain steady progress on their assigned tasks.

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?

- By the end of the project, the URCA Assistant will be able to create and prepare 3D models for VR use, develop interactive elements within a VR platform, and solve technical problems through testing and debugging.

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:

- CS382-001: Game Design, Development & Tec

Other requirements or notes to applicants: