We are looking for...
motivated students interested in applying their computing and engineering knowledge (e.g. materials science, computational science, robotics, nanoelectronics, bioinformatics, etc.) to research how individuals apply representations and computing principles and tools to understand complex phenomena in engineering and technology.

We will...
provide you with a highly flexible and interdisciplinary program that will allow you to design a valuable graduate education experience.
offer a supportive climate to succeed and prepare you to apply or research information systems or technologies in diverse professional domains
prepare you as future professional or academic to be proactive in addressing the challenges of the 21st century, shaping events, and creating the future.

Research Approach

Our research approach is guided by activity-theoretic perspectives and is implemented through design-based research and design experiment methodologies.

Contact us
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Rocketed Group Goals

Improve student learning and engagement in engineering and technology instruction through:
- developing and incorporating advances in learning sciences into authoring curriculum, assessment and learning materials
- integrating authentic and realistic computing experiences from research, models, simulations and other cyberinfrastructure technologies

Study, design, implement, evaluate, and synthesize novel curricular approaches and learning strategies that:
- leverage scientific thinking and computational thinking in engineering and technology education
- enhance student understanding of scientific representations and apply computational concepts, methods and cyberinfrastructure technologies in scientific inquiry environments

Current Research Agenda

- Investigating student interpretation of scientific representations in engineering and science
- Learning and teaching with and about computational simulation, visualization, and haptic tools
- Integrating computational thinking and scientific thinking in engineering and technology
- Investigating modes of learning of computational science, high performance computing, and high performance computer graphics principles and procedures
- Identifying and measuring how cyberinfrastructure technologies support communities of practice in research and learning activities

Specific Projects

Characterizing Simulation-Based Engineering and Science:
- Identify which and how modern computational methods, devices and collateral technologies together with computational thinking are combined to address complex problems outside the scope of traditional numerical methods.

Investigating the role of computational simulations as learning tools for Materials Engineering and Nanoelectronics:
- Identify how materials engineering and nanoelectronics learning and scientific practices collaborate with the interactive properties of computational tools where knowledge is represented, constructed and communicated.
- Investigate the role of computational tools, visualization tools and haptic devices as cognitive tools to leverage the understanding of scientific representations.

Integrating computational, scientific, and engineering thinking into K-12 education:
- Develop a novel curricular approach in bioinformatics education integrating Science Standards and AP Computer Science Principles to convey computing principles and practices
- Investigate K-12 teachers technological pedagogical content knowledge of computing and information technology.
- Identify the role of robotics learning experiences to enhance learners' computational thinking.