

Research Experiences for Undergraduates summer program



The 2004 class of REU students

About the program

Undergraduate students from diverse universities and colleges all over the country come to ISR for 10 summer weeks (early June – mid-August) to gain experience in systems research and the research process by working with ISR faculty and advanced graduate student mentors.

ISR's REU program also offers an intensive co-curriculum to provide students an additional context for their laboratory work. In conjunction with their individual and team projects, through workshops and off-site visits, REU participants explore the characteristics and social impact of scientific research and engineering.

By participating in the REU program, students will:

- Establish a basis for systems thinking by conducting research, and understand systems engineering as a unique discipline
- Acquire broader and deeper understanding of both the research process and the practice of engineering, and how new knowledge is created and communicated
- Develop multicultural understanding and team competence, and become aware of the societal implications of research

When asked about their overall experiences in the REU program one student said, "I thought it was a good blend of tools; the actual research we did, perspectives on the field from people who have experience in it, reflection on the impact of what we engineer, and emphasis on systems engineering... I had a rewarding experience this summer." Another recent REU student added, "It was truly a great

experience and I'm very happy that I've spent my summer in this program."

Program specifics

Competition for selection is lively; unlike in a traditional admissions process, a close match of applicant interest with current faculty research is key, along with strong academic qualifications. Funding is available for 15 participants, and applications are welcomed from any institution, including the University of Maryland. Students from colleges and universities having limited research facilities, including tribal colleges and universities, and community and liberal arts colleges, are strongly encouraged to apply. Only U.S. citizens and permanent residents are eligible to participate.

REU awards are made on the basis of students' strong motivation and potential to perform systems engineering research, academic preparation in their area of interest, and interest in interacting with diverse mentors and peers in interdisciplinary science and engineering.

All participants receive a stipend during their 10-week stay. Limited funding is available for full or partial housing and meal costs.

Examples of student research

REU participants engage primarily in laboratory research under the supervision of ISR faculty members and advanced graduate student mentors. Student research may include participation in the following projects: development of BioMEMS packaging technology, improving decision-making in product development, human face recognition using 3D models, visually-guided audition for formation control in search and safety, measurement of friction

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in micro ball bearings, compliant multi-material meshes, packaging and cleaning of microchips used for dielectrophoresis testing, design, fabrication and characterization of polypyrrole vapor-sensing devices, software to prevent distributed denial of service attacks. For a more complete list of previous REU research, please visit www.isr.umd.edu/ISR/education/REU/pastprojects.html

Associated Labs

The following labs are associated with and/or have sponsored REU students and their research in the past.

- Computer Integrated Manufacturing Laboratory www.isr.umd.edu/Labs/CIM/
- Intelligent Servosystems Laboratory www.isr.umd.edu/Labs/ISL/isl.html
- Advanced Information Technology Laboratory www.cs.umd.edu/users/hendler/AITL
- Systems Engineering and Integration Laboratory www.isr.umd.edu/Labs/SEIL/
- Neural Systems Laboratory www.isr.umd.edu/Labs/NSL/nsl.html
- Communication and Signal Processing Laboratory www.cspl.umd.edu/
- MEMS (microelectromechanical systems) Sensor and Actuators Laboratory www.ece.umd.edu/MEMS/
- Computer Aided Control Systems Engineering Lab

Support

In 2003, the National Science Foundation Research awarded ISR a five-year Research Experiences for Undergraduates (REU) Site program (NSF Grant #0243803), *Introducing the Systems Engineering Paradigm to Young Researchers and Future Leaders*.

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REU web site

www.isr.umd.edu/ISR/education/REU/