Department of Mechanical & Materials Engineering
COLLEGE OF ENGINEERING & APPLIED SCIENCE

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 1, 2014

The IMS (Intelligent Maintenance Systems) Center in the Department of Mechanical & Materials Engineering is pleased to offer the following research project for the summer of 2014. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

Technologies for Improving the Mobility, Safety and Independence of Beechwood Home Residents

Professor Jay Lee
Department of Mechanical & Materials Engineering
Baldwin Hall 560
Cincinnati, OH 45221-0072
Tel: (513) 556-2493
Fax: (513) 556-3390
Email: jay.lee@uc.edu

Project Description

Students accepted in this REWU program can expect to participate in ongoing research in the area of developing technologies for improving, as well as enhancing, the mobility, safety and independence of residents of the Beechwood Home. The Beechwood Home is a not-for-profit long-term care nursing facility in Cincinnati, Ohio, and specializes in providing high-quality long-term care, together with advanced rehabilitation and restorative services, as well as therapeutic and recreational activities that assist in optimal functionality. Residents of the Beechwood Home have a number of degenerative neurological and neuromuscular conditions - such as Huntington's, ALS (Amyotrophic lateral sclerosis Syndrome) and Cerebral Palsy, among others - all of which result in limiting their physical activity. The IMS Center is currently focused on three specific areas of research: improving wheelchair safety and mobility; improving residents' interaction with their environment through advanced connectivity and autonomous technologies; and resident tracking, both in terms of location and current health condition. Preliminary work is underway by senior design students in the development of wheelchair safety and resident tracking. The WISE REWU participants will be expected to study existing work in these areas by other organizations, as well as the work of the current senior design teams, with the goal of having the WISE participants continue this work once members of these teams graduate. WISE participants may also consider graduate education with the Center to continue the research, and work in this area. Graduate researchers from the IMS Center will be available as project leaders, guides and mentors.

Specifically participants will acquire experience in performing state-of-the-art literature review; understanding and assisting in the design of mechanical and electro-mechanical systems; the principals of data acquisition and analysis; crafting project reports and technical documentation; and direct collaboration with a not-for-profit organization. Participants will also gain an understanding of the conditions affecting residents of the Beechwood Home and how engineers and engineering research can bring about positive impacts for members of the community.