

**COLLEGE OF ENGINEERING**

**MCMICKEN COLLEGE OF ARTS AND SCIENCES**

**SUMMER RESEARCH OPPORTUNITIES  
FOR UNDERGRADUATE WOMEN**

**APPLICATION DEADLINE: March 1, 2007**

*The Department of Mechanical, Industrial and Nuclear Engineering is pleased to offer the following research project for the summer of 2007. 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.*

**Computer Modeling and Simulations of Micro-Electro-Mechanical Systems  
(MEMS)**

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Sponsor:

**The National Science Foundation (NSF)**

**Project Description**

MEMS devices are being used increasingly in many engineering applications. MEMS devices are very small in length scale and often involve multi-physics phenomena, including motion, deformation, stress, electrical, thermal and fluid flow problems. They are also very expensive to fabricate and to conduct the tests. Thus, to design better MEMS devices, computer modeling and simulations can play a significant role. Both commercial and special research software can be applied for this purpose. In the CAE Research Lab at the UC, advanced simulation codes are being developed for analyzing MEMS devices to study their mechanical and electrical properties.

In this project, the student will have the opportunity to first study MEMS problems and related commercial software packages. Then the student will build a few MEMS models and conduct the analyses using both the commercial code and the in-house codes developed in the CAE Research Lab. Advantages and disadvantages of each code will be studied and documented. During the project period, the student will also have the opportunity to attend one national conference (The Ninth U.S. National Congress on Computational Mechanics) to learn the broader scopes of the computational methods in engineering. Dr. Yijun Liu from Mechanical Engineering will be the primary mentor for this WISE project. The student will also receive assistance from two experienced graduate students in the CAE Research Lab. The student will be supported by an NSF grant for this project.

