UC SANTA BARBARA

THE Current

September 14, 2000
Gail Brown

Federal Funds for Information Technology go to UC Santa Barbara and Research into "Bio-Chips" and Drug Implants

Major new funding will come to the College of Engineering's computer science department at the University of California, Santa Barbara from the National Science Foundation (NSF) as part of the first grants under the new $90 million Information Technology Research initiative.

Two UCSB proposals were chosen from among 1,400 submitted nationally. They were announced Wednesday.

"This initiative will help strengthen America's leadership in a sector that has accounted for one-third of U.S. economic growth in recent years," said President Clinton. "High technology is generating jobs that pay 85 percent more than the average private sector wage. I am pleased that the National Science Foundation is expanding its investment in long-term information technology research. I urge the Congress to provide full funding for NSF so that they can continue to make these kinds of investments in America's future." UCSB computer scientist Linda Petzold's team will receive $2,900,000 over four years. Her project is called "Information Technology Research: Computational Infrastructure for Microfluidic Systems with Applications to Biotechnology.

The other award goes to Ming Li for Informational Technology Research: Collaborative Research:

Computational Techniques for Applied Bioinformatics. His research team will receive $295,000 over one year. According to Petzold, the grant will allow researchers to develop a computing infrastructure for microfluidics, with important applications for biotechnology. Their research will advance the science of bio-chips and microscale surgical tools. It will pursue the understanding of the mixing of fluids in tiny devices.

According to the proposal, a specific example is the design of implantable drug delivery microsystems.

Many diseases, from cancers to neurodegenerative conditions, can be effectively treated with small amounts of well-directed but highly toxic chemicals.

The implantable drug delivery microsystem concept is that controllable flow delivery systems could be semi-permanently implanted in the body. With effective sensing capability, these microsystems can deliver medication in an autonomous, highly targeted way.

Frequently such systems require: the mixing of two or more components; non-clogging valves and channels; and integrated volume flow rate measurement and control of fluids. Many of these factors can be addressed through optimized design.

Most of the conventional computational tools available today are not equipped to handle such issues or to provide the very high accuracy that will be required for example in drug delivery, according to the researchers. Consequently they propose the development of high-accuracy simulation tools. The researchers note that the project offers a superb opportunity for close collaboration between student and postgraduate researchers in computer science, mechanical engineering and materials, in the type of interdisciplinary team work for which UCSB is known.

The proposal pool was very competitive. "The response has been overwhelming," said Ruzena Bajcsy, who heads the NSF Directorate for Computer and Information Science and Engineering. "Because fund requests by proposers exceeded $3.2 billion, there were many more worthwhile projects proposed than we are able to support. The volume and quality of proposals are strong evidence justifying our desire to triple NSF's Information Technology Research budget over the next five years."

Regarding the winning proposals, Rita Colwell, director of NSF said, "These projects represent major innovations in information technology, rather than routine applications of existing technology. Our strategy to support long-term, high-risk research responds to a challenge from the President's Information Technology Advisory Committee, which called for increased federal investment to maintain the U.S. lead in this important sector of the global economy.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.