

2000-2001 Outstanding Scholarly Achievement Award

The Outstanding Scholarly Achievement Award is given each year to a faculty member who has, over many years, made significant contributions to a discipline through scholarly activity, creative/artistic endeavors, research, and publication. The award is intended to recognize work accomplished at CSUS. Tien I-Liu, Professor of Mechanical Engineering is the fortieth recipient of this award.

Dr. Liu received his B.S. degree from National Taiwan University and both his M.S. and Ph.D. degrees from the University of Wisconsin, Madison. He joined the CSUS Department of Mechanical Engineering in 1987. His scholarly output includes authoring more than 70 technical papers and the writing or editing of 19 books, manuals, and reports. He also holds twelve software copyrights and one patent. In 1998, he received the “Best Organizer of Symposium and Sessions” Award from the American Society of Mechanical Engineers (ASME). He was a recipient of a United Nations Development Program Award in 1998. He received the CSUS President's Award for Research and Creative Activity in 1992.

TECHNIQUES FOR GLOBAL COMPETITIVENESS

Thomas Tien-I Liu
Professor, Mechanical Engineering
California State University, Sacramento

The current trend of the economy is globalization. In order to compete globally, people and corporations need to use efficient and effective techniques including information technology, concurrent design, and continuous improvement.

As the technology of the Internet expands all over the world, it enhances the capabilities of design, production, and distribution. The web-based technology includes not only the sharing of resources, but also the rapid distribution of information. Neural networks have been developed to simulate biological nervous systems; they are best at performing the types of tasks that need human perception. Fuzzy logic is a well-defined reasoning system, which is specifically designed to deal with the ambiguities. Expert systems are computer systems that possess the capability of a human expert; they are very suitable for solving problems that require heuristic rules. Implementation of these techniques has been made possible by recent developments in computer hardware and software.

Concurrent design has been widely used to develop products and processes. In the design stage, a multi-disciplinary design team is formed. Various aspects including product performance, manufacturing, quality, cost, service, and environment are taken into consideration during the design stage. This technique can dramatically enhance quality and productivity, and greatly reduce the product development time and life cycle cost.

Continuous improvement has been successfully used in commerce and industry. Continuous improvement can improve competitiveness by solving problems continuously in small steps. Many products can be greatly enhanced by applying continuous improvement techniques.

Implementing these techniques requires well-trained individuals. Therefore, these issues are more than just technical; they concern people and education.