

Mechanical Engineering/College of Engineering and Applied Sciences
MECHANICAL ENGINEERING DISTINGUISHED LECTURE



Dr. J. Michael McCarthy, Professor
Department of Mechanical and Aerospace Engineering
School of Engineering University of California, Irvine
Irvine, CA 92697

Kinematic Synthesis of Constrained Robotic Systems

Seminar Coordinator: Dr. Jeffrey Ge, Department of Mechanical Engineering/CEAS (telephone 631- 632-8305)
Date: Wednesday, November 8, 2006, 2:00PM-3:00PM, room 250 of Light Engineering.

Abstract

This presentation describes the mathematical theory of linkage synthesis based on the solution of generalized inverse kinematics equations for planar and spatial serial chains. The algebraic solution of these synthesis equations is shown to pose severe computational demands. Recent results show that a sequential solution strategy provides a design capability for new six and eight-bar planar chains, even 10-bar and 12-bar chains that provide new design opportunities.

Biography

Professor McCarthy is a member of the faculty of the Department of Mechanical and Aerospace Engineering, at the University of California at Irvine, with expertise in machine and robotic system design. He received his Bachelors of Science in Mechanical Engineering from Loyola Marymount University (1974), his Masters of Science (1975) and Ph.D. (1979) degrees in Mechanical Engineering from Stanford University. He worked for FMC Corporation, taught at Loyola Marymount University and the University of Pennsylvania, before moving to UCI in 1986. He has over 130 publications, has edited one book, Kinematics of Robot Manipulators, and authored two more, Introduction to Theoretical Kinematics and Geometric Design of Linkages, and has served as a consultant to a number of companies in the area of machine and robotic system design, as well as a legal consultant on engineering design. Recently, he served for 18 months as Chief Technical Officer of a medical robotics company. He returned to UCI with a commitment to developing leadership through student involvement in major engineering projects, such the design, manufacture and testing of racecars for intercollegiate competition. His research team is responsible for the Sphinx, SphinxPC and Synthetica software, which extended computer-aided linkage synthesis to spherical and spatial linkage systems. His papers introducing Synthetica and on the synthesis of compliant mechanisms received best paper awards. He has presented tutorials on the geometric design of robots and spatial linkage systems at both the ASME DETC and the IEEE International Conference on Robotics and Automation. He has served ASME as chair of the Mechanisms Committee, conference chair for the 1996 Design Engineering Technical Conferences, and is currently the editor of the ASME Journal of Mechanical Design.

Directions: refer to website: <http://www.sunysb.edu> or call Ann Berrios at 631-632-8300 for more information. Check <http://me.eng.sunysb.edu> for any changes in time or location.