ELECTRICAL & COMPUTER ENGINEERING RESEARCH TALK

ARAS Surgical Robotics Research: Developed Eye Surgery Robots and Haptic Training System

Dr. Hamid D. Taghirad

K.N. Toosi University of Technology, Iran

Tuesday August 13, 2019 at 11:45 am

Host: Dr. Mahdi Tavakoli

Pizza and refreshments will be served

DICE 7-395

Abstract: ARAS surgical robotics group aims at developing new robotics-based technologies for robot-assisted surgery and surgery training applications. This includes design and integration of mechanical and electrical components as well as development of innovative control structures for such systems. These robotic systems will enhance the safety and efficiency of medical surgeries which leads to more satisfaction in all bodies of healthcare systems specially the patients, the surgeons, and the residents.

In this talk a brief overview on the robotics technologies developed for eye surgery such as Preceyes, Steady-Hand, is introduced and the recent development of ARAS Diamond robot: Robot-assisted eye surgery system with a master-slave teleoperation structure is presented. Then the current research project of the group: ARAS HAptic System for Eye Surgery Training (ARASH-ASiST) is introduced and its developed control schemes to further enhance the training system will be elaborated in details. Our collaboration with the professors, and surgeons in Farabi Eye Hospital, the Center of Excellence in Ophthalmology, and BioRobotics Research Laboratory at Queen's University is a valuable and constructive asset for this project. This project has been funded by Iranian National Institute for Medical Research Development (NIMAD) and Iranian Research Network in Ophthalmology.

Bio: **Prof. Hamid D. Taghirad** has received his B.Sc. degree in mechanical engineering from Sharif University of Technology, Tehran, Iran, in 1989, his M.Sc. in mechanical engineering in 1993, and his Ph.D. in electrical engineering in 1997, both from McGill University, Montreal, Canada.

He is currently the University Vice-Chancellor for Global strategies and International Affairs, Professor and the Director of the Advanced Robotics and Automated System (ARAS), Department of Systems and Control, Faculty of Electrical Engineering, K. N. Toosi University of Technology, Tehran, Iran. He is a senior member of IEEE, and Editorial board of International Journal of Robotics: Theory and Application, and International Journal of Advanced Robotic Systems.

His research interest is robust and nonlinear control applied to robotic systems. His publications include five books, including Parallel Robots: Mechanics and Control, and more than 250 papers in international Journals and conference proceedings.