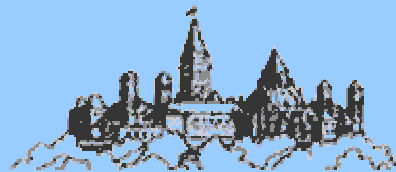




IEEE

**Ottawa
Section**



Haptic technology and its application to surgery

Dr. Peter Liu

*Tier II Canada Research Chair in
Interactive Network Computing and Teleoperation*

*Associate Professor, Department of Systems and
Computer Engineering, Carleton University*

Of human five major senses (sight, hearing, touch, smell, and taste), the sense of touch through the hands is of particular importance because it is the only channel by which we can not only feel an object in the external world, but also explore, manipulate, and even change it physically.

This talk will focus on haptics -- an emerging technology that enables a user to interact with computer simulations, remote environments or micro-/nano-worlds through the sense of touch. With the provision of faithful and stable haptic interaction, a surgeon may perform a cardiac surgery without opening the patient's chest (i.e., minimally invasive surgery) or even over a distance (i.e., telesurgery), surgical residents can acquire hands-on skills through operating on virtual patients simulated in computers, and medical researchers may manipulate molecules or atoms to build, change or repair DNA structures in order to treat hereditary diseases.

Realistic haptic interaction, however, is particularly difficult to achieve since it cannot be experienced passively like voice and vision, but inherently requires physical contact as kinesthetic energy flows bi-directionally from and to the user. This presentation will touch some of the outstanding issues and engineering challenges and show some research projects performed at Carleton University.

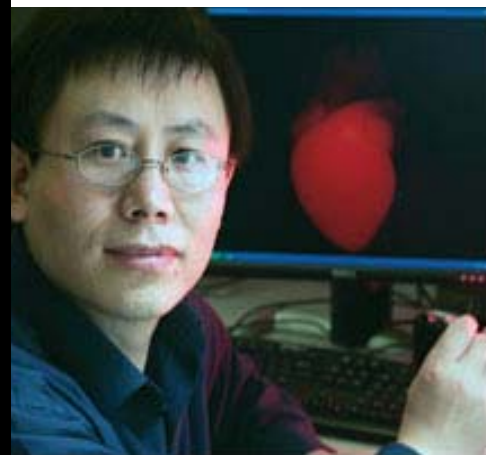
Nov 7, 2007

admission is free

13:30 – 15:00 pm

**Mackenzie Building 4359
Carleton University**

Light refreshment will be served



Dr. Liu received his B.S. degree and M.S. degree from Northern Jiaotong University (Beijing, China) in 1992 and 1995 respectively. After 4 years as an engineer in industry, he came back to university in 1999 and received his Ph.D. degree from University of Alberta in 2002. Since then, he has been a faculty member at the Department of Systems and Computer Engineering, Carleton University. His research interest is in the areas of interactive networked systems, robotics, haptics, context-aware networks and their applications to biomedical engineering.



IEEE EMBS Ottawa Chapter

<http://ewh.ieee.org/r7/ottawa/embs/>

CU@EMBS

<http://www.embs.engsoc.org/>