



## **Engineering, Medicine & Biology Lecture**

### **Advanced Control of Powered Artificial Limbs (Myoelectric Control of Prosthetics)**

#### **Abstract:**

Artificial limbs have provided cosmetic and functional replacements for those with deficiencies due to congenital defect or traumatic injury for many years. This form of control, using the myoelectric signal (MES), provides a user with a self-contained, autonomous means of controlling a powered prosthesis. This seminar will describe the evolution of control using MES to its current state of the art. The University of New Brunswick has developed a microprocessor-based multifunction control system which uses an artificial neural network to perform pattern recognition. This controller is a real-time embedded system that must meet the speed, power, and size constraints imposed by the prosthetic control problem. Current research in the field involves advanced signal processing and pattern recognition techniques; the impact of these technologies will be discussed. A concluding discussion will provide a look into the future of human-machine interfaces: a direct interface to the nervous system.

Dr. Englehart leads a team of researchers at the Institute of Biomedical Engineering that have developed the world's most sophisticated control system for powered upper limb prostheses. A recent partnership with The Defense Advanced Research Projects Agency (DARPA) in the U.S. will result in dramatic advances in artificial limbs, and clinical trials that will make these limbs available to users in the near future. Dr. Englehart currently serves as a grant selection committee member in Canada (NSERC), the United States (National Institutes of Health) and Hong Kong (HK Grants Council).

**DATE: Tuesday, April 18, 2006**

**TIME: 2:30pm**

**LOCATION: Davis Center 1304**  
University of Waterloo