

Computer Science Seminar Series, 2010

National Capital Region

Biomechanical Modeling and Simulation of Human Eye Movement

Speaker: Dr. Qi Wei
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1:00PM- 2:00PM, NVC 325

Abstract

Biomechanical simulation of human eye movements may greatly advance our understanding of the complexities of the oculomotor system and aid in treatment of visuomotor disorders. I will describe the first three dimensional biomechanical model of the orbit that can simulate the dynamics of ocular motility. The model incorporates realistic anatomical and physiological characteristics of the orbital plant, and can implement different types of extraocular pulleys. Various kinds of eye movements such as fixations, smooth pursuits, and saccades can be simulated. It is sufficiently general and adaptable for both scientific research and clinical applications. Several studies were performed to assess the validity and utility of the model. I will also present a template-based approach on reconstructing subject-specific 3D models of the orbit from magnetic resonance imaging (MRI) and an efficient method on estimating longitudinal strains from generalized cylindrical tissues.

Biography

Qi Wei is a postdoctoral fellow in the Feinberg School of Medicine at Northwestern University. She received her Ph.D. from Rutgers University in 2010 and her M.Sc. degree from the University of British Columbia in 2004, both in Computer Science. Her research is focused on biomedical imaging, computational modeling and simulation, and eye movement.