

MECHANICAL AND AEROSPACE ENGINEERING SEMINAR
University of Virginia, Charlottesville, Virginia

Kate Holzbaur

Title: Upper Limb Scaling and Computational Modeling

TIME: Thursday, November 1, 2007, 4PM

PLACE: MEC 341, Mechanical Engineering Building

Refreshments at 3:30 PM in MAE Faculty Lounge, MEC 305

Abstract:

The biomechanics of the upper limb have been examined extensively to understand neural control of movement, interactions of muscle structure and function, and surgical strategies to improve function. In general, studies have examined individual upper limb joints. However, the actions of muscles crossing one joint are highly dependent on the posture and motion of adjacent joints. My goal is to develop computational tools and obtain experimental data that will provide a platform for exploring the multijoint function of the upper limb and the control necessary to produce upper limb movement. This presentation will discuss the development of a three-dimensional musculoskeletal upper limb model including 50 muscle-tendon actuators crossing the glenohumeral joint, elbow, forearm, and wrist; and some applications will be discussed. In addition, I will discuss how I used magnetic resonance imaging and strength assessments of young, healthy subjects to determine scaling relationships across individuals of different size. This work provides new insight into the structure of the upper limb, and creates a basis for performing novel research into control of individual upper limb muscles.

Bio:

Dr. Holzbaur received her BS in Engineering at Brown University in 2000, and her MS and PhD in Mechanical Engineering at Stanford University, completing her studies in 2005. After completing a post-doc at the VA Palo Alto Bone and Joint Center, she joined the faculty in Biomedical Engineering At Wake Forest University School of Medicine, which is part of the joint School of Biomedical Engineering and Sciences between Virginia Tech and Wake Forest University.