

Fall 2009 Bioengineering Seminar Series

**Uses of 6 Passive Degree of Freedom Pure Moment
Testing in Orthopaedics Biomechanics:
*Testing Methodology and Implementation***

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The consideration of joint kinematics is a primary focus in the assessment of joint structure and function. In the characterization of joint replacements and joint reconstruction techniques, it is critical to consider the native motion of the intact joint and to compare that to the motion of the joint following surgery. Many researchers have devised sophisticated methods to reproduce physiologic motion under active control. These include combinations of simulated muscle contractions and robotic manipulators. Motion and load feedback is used to establish active control of joint response and is dependent on the response time of the system. Such a system must be tuned to reproduce physiologic motion. While the motion of the intact joint can be modeled based on established joint kinematics from human subject testing, it is technically challenging to program a highly constrained system to simulate an unknown condition such as a novel total joint. In such cases, it is important to have a system that allows for unconstrained joint response, while imparting motion that is controlled and reproducible. The application of pure moments in a 6-degree of freedom testing system has been utilized extensively in spinal biomechanics to establish the passive response of this complex joint. Such a technique has been combined with other testing protocols to account for passive muscle loading and the force due to gravity. This talk will focus on the use of pure moment testing in the characterization of spinal motion and its uses in other joints throughout the body, including the ankle and the knee.

Where: SSOE Seminar Room, NI 1027

When: Friday, November 6, 2009

Time: Refreshments 11:45 – 12:00 noon,
Seminar 12:00 – 1:00 pm