IEM SEMINAR SERIES

TUESDAY
November 15th, 2016

The Role of Dynamic Joint Function in the Assessment and Treatment of Musculoskeletal Injury and Disease

Institute for Engineering in Medicine

UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Dr. Scott Tashman
Professor
Department of Orthopedic Surgery
University of Texas Health Science Center

FREE event, no registration required.

Pizza and Beverages will be provided from 11:45 am

12:00PM - 1:00PM
Mayo Memorial Building
Room 3-100

For additional information on Dr. Tashman's presentation please contact:
scot0353@umn.edu

The Institute for Engineering in Medicine (IEM) is pleased to announce a seminar by Dr. Scott Tashman, "The Role of Dynamic Joint Function in the Assessment and Treatment of Musculoskeletal Injury and Disease."

Accurate measures of musculoskeletal kinematics are essential for understanding the function of healthy joints, the causes and impact of injury or disease, and the effectiveness of orthopaedic treatment. The motion and loading patterns of joints are determined not only by the skeletal geometry and ligamentous constraints, but also by task-specific combinations of external and muscle forces. Thus, in order to understand the function of healthy joints, as well as the factors responsible for joint injury and degeneration, it is essential to assess joint motion in vivo during dynamic, functional, high-loading activities (e.g. walking, running, etc).

There are many alternatives for assessing musculoskeletal motion, but dynamic stereo-radiography (DSX) is the only currently available imaging modality that combines true 3D measurement, sub-mm accuracy, high frame rates and freedom from skin motion artifact. By combining X-ray imaging hardware optimized for dynamic studies (incorporating low-dose pulsed x-ray at rates up to 180 frames/s) with an extensive software library for image processing and kinematic analysis, joint motion can be assessed during a variety of functional activities, with accuracy in the range of 50 to 500 ·m. With the addition of high-resolution (static) CT and MRI for defining subject-specific skeletal and soft tissue geometry and the use of radiopaque markers, dynamic ligament function and articular contact can also be evaluated with DSX.

Dr. Tashman's primary areas of expertise are in vivo, dynamic assessment of joint function and musculoskeletal modeling. His research has focused on the relationships between musculoskeletal function and the development, treatment and prevention of orthopaedic injury/disease, including ligament/meniscus injury, osteoarthritis, disorders of the cervical and lumbar spine and neuromuscular diseases. His work is primarily translational, working together with orthopaedic surgeons, rehabilitation specialists and other scientists on in vivo studies to improve knowledge, diagnosis and treatment of musculoskeletal injury/disease. His work has been funded by the National Institutes of Health continuously since 1995, as well as by numerous other public and private organizations. He currently has 110 publications in peer-reviewed journals.

For more information on the IEM Seminar Series, visit www.iem/umn.edu/SeminarsLectures/Seminars_index.html