SEMINAR - סמינר

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 13.11.2017 (כ"ד בחשון, תשע"ח), בבניין דן קאהן, אודיטוריום 1, 14:30.

מרצה:

Prof. Peter Vee Sin Lee

Mechanical Engineering Department
University of Melbourne Australia

על הנושא:

Mechanobiology of Post Traumatic Knee Osteoarthritis

The seminar will be given in English

להלן תקציר ההרצאה:

Post traumatic knee osteoarthritis (OA) is often associated with extreme loading on the articular surface in our knee joints. An OA joint causes pain affecting patient's mobility and quality of life. Research in preventing the joints from such degeneration includes tissue engineering, stem cells therapy, reparative surgery, and if unsuccessful, a total joint replacement will be required. A fundamental knowledge needed to improve these efforts lies in understanding how forces are applied to the human, transferred to the tissue and transduced into biological responses. In this aspect, we have developed multi-scale models and experiments to obtain quantitative biomechanical information such as muscles forces, ligament forces, stresses on cartilage and bone in the knee joint related to injury. Human subjects' jump landing maneuvers common in many sports, such as basketball and skiing that could lead to knee injury, were conducted in a motion analysis laboratory. The kinematics, kinetics, energetics and muscles forces during landing from different heights were quantified. Using data from human subjects' experiment, non-injurious loadings were scaled into loads that could cause injury using a high-speed mechanical test system on cadavers' knee specimens. The injury threshold for cartilage and bone damage could then be established. Finally, the human subjects' and cadavers' knee joints studies provided data to apply physiological loadings to osteochondral explants, enabling the study of realistic bone microstructure damages and degenerative changes in cartilage and chondrocytes. In addition to these experiments, multi scale lower limb musculoskeletal models and finite element models of cartilage / bone microstructures and chondrocytes were developed. These experimental and computation models will help improve our understanding of cartilage/ bone/ cell injury due to impact loading.

מארח: פרופ'/ח אלון וולף

בברכה,

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