Title: **A Quantitative MR Imaging and Image Analysis Pipeline for Assessment of Trabecular Bone Micro-Architecture**

Speaker:
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Time: 3:00 pm - 4:00 pm
Venue: Room 603, Chow Yei Ching Building

Abstract:
Trabecular bone (TB) micro-architecture provides valuable insight into the biomechanical properties of bone, which is useful in the diagnosis and follow-up of patients with disorders of bone mineral homeostasis. However, due to lack of technology able to obtain in vivo images with sufficient resolution comparable to TB thickness and algorithms to compute representative parameters, the method's potential had not been fully attained.

Our laboratory has developed a series of technologies that are critical for translating this quantitative imaging diagnostic tool into clinical use. The approach consists of acquisition of high-resolution magnetic resonance images at 100-200μm resolution, followed by a cascade of processing steps that include correction for subject motion during the scan, prospective and retrospective image registration, and computation of a series of topological and morphologic parameters. Here, each component of the processing pipeline is described and results on the method's performance is discussed in a cohort of 20 women, ages 50-75 years, evaluated three times, in terms of reproducibility of a host of architectural and mechanical parameters derived from images of the distal radius.

Biography of the speaker:
Benny Lam is a Postdoctoral Research Fellow in the Laboratory for Structural NMR

Imaging at the University of Pennsylvania. He received his B.Eng (EEE) and M.Phil from the University of Hong Kong in 2001 and 2003 and his PhD in Biomedical Engineering from the University of Southampton, UK, in 2007. Prior to joining the Laboratory for Structural NMR Imaging, Benny spent a year as a Postdoctoral Associate at Howard Hughes Medical Institute, Janelia Farm Research Campus near Washington DC. His current work focuses on biomedical image analysis, including automatic image feature representation, segmentation, registration and motion tracking. Currently, Benny is developing methods to quantitatively characterize 3D anatomical structures from in vivo magnetic resonance (MR) images in the region of micron and submicron resolution.

Organizer: Prof. S.C. Chan