BIOMEDICAL ENGINEERING
Carnegie Mellon University

Thursday, October 11, 2018
10:30 – 11:30 a.m.
Baker Hall 136A

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Bone Bioengineering:
Microstructure, Mechanics, Mechanobiology, and Beyond

Abstract: Bone Bioengineering Laboratory is developing innovative technology in microstructural assessments, biomechanical modeling, multiscale and mechanobiological approaches in skeletal research. Bone Bioengineering has both basic science and clinical significances in many medical fields, such as osteoporosis, osteoarthritis, or intervertebral disc degenerations. I will highlight our development of a three-dimensional imaging analysis and modeling technique for trabecular bone microstructure, its applications in basic science research of bone mechanics, and clinical applications in osteoporosis and osteoarthritis. In parallel to these developments, we will also discuss our multiscale mechanobiological approaches in understanding the mechanisms of how bone senses and responds to mechanical loading and showcase some recent findings in new mechano-transduction-mechano phenomena. Finally, we will discuss bone microstructural phenotypes in difference races and their implications in genetic and precision medicine, anthropology, evolution and mechanobiology of the skeletons.