School of Engineering

UCMERCED

Mechanical Engineering

Additive Manufacturing and Biomechanics Research and Outreach Activities at the NMSU CEMMS Lab

Additive manufacturing (AM) has experienced a significant surge in popularity in recent years, with applications spanning from hobbyist projects to the creation of production-quality critical components. While AM presents several major advantages, such as reduced setup costs and the ability to construct intricate geometries, it also introduces notable challenges, including inherent process and final product variability. There is a pressing need to develop robust quality control methods for AM parts produced from polymers, metals, and composites. The first segment of this presentation delves into two active projects focusing on quality control in AM and discusses recent work on infrared imaging and X-ray computed tomography. The presentation will also highlight some workforce development and outreach initiatives related to AM at NMSU.

The mechanical attributes of tissues and cells are critically important in various biological processes. While the significance of stiffness in mineralized tissues (like bones) is clear, the mechanical properties and interactions of individual cells remain less understood. The latter part of the presentation details two ongoing research endeavors: one focuses on the mechanical characterization of cortical bone at the sub-micron scale, and the other of the surface of live Xenopus Laevis oocytes at the microscale. Additionally, outreach programs designed to foster interest in mechanics of materials research, targeting both secondary school and university student demographics, will be discussed.

Friday, October 27, 2023 – 10:30 am – COB 110

Dr. Borys Drach
Mechanical & Aerospace Engineering at New Mexico State University

Dr. Borys Drach is an Associate Professor in the Department of Mechanical & Aerospace Engineering at New Mexico State University. He began his tenure at NMSU in August 2013, after receiving his Doctorate from the University of New Hampshire. Prior to his doctoral studies, he earned a Bachelor of Science degree from Kyiv Polytechnic Institute. Dr. Drach's research pursuits focus on both computational and experimental mechanics of materials and structures with applications in the areas of composites, metals, and biological materials.