Adhesion and Contact in Healthcare or Energy Related Materials and Structures

Abstract
Contact and adhesion between different components in many complex structures are crucial for their performance and life-time. This talk will present the results of a combined experimental and computational study of adhesion and contact in small structures that are relevant to applications in healthcare or energy. This work combines nano or micro scale experiments measurements of mechanical properties with analytical and computational models that enabled the prediction of contact and adhesion at the micro and macro-scales.

The adhesion between polymeric drug coating and the metallic substrates is characterized to design robust drug-eluting stents satisfying FDA guidance; Inspired by natural teeth, functionally graded nanocomposite materials are developed for novel designs of dental crowns that are more resistant to cracking under contact loads; The other materials and structures that are investigated include dental implants and organic light-emitting diodes (OLEDs).

Biography
Dr. Jing Du is an assistant professor of mechanical engineering at Penn State University. She received her B.S. and M.S. degrees in Mechanical Engineering and Materials Science and Engineering, respectively, from Tsinghua University and a Ph.D. degree in Mechanical & Aerospace Engineering from Princeton University. Before joining Penn State, she was a postdoctoral scholar in the School of Dentistry at the University of California, San Francisco (UCSF). Her research focuses on solid mechanics and materials science. Her current areas of research interests include interfacial fracture between dissimilar materials, mechanics of biological materials and biomaterials, biomedical devices and bio-inspired design.