Title : Nature and Origami inspired Robotics

Abstract

The Primary advantages of folded robot design are that the inherent accessibility and low cost of the method permits designers to get design feedback early and often via fast prototyping cycles. While prototyping is relatively fast, the complexity of multi-layer articulated designs can be time-consuming and unwieldy to design. I am developing an integrative design methodology to make the design and manufacture of foldable robots more convenient for non-experts. Using the folding structure, we can mimic organisms in nature and abstract principles for robotic applications. Today's talk shows the robot design with the folding structure based on kinematics and dynamics of the mechanisms that are inspired by nature. I will present an innovative methodology for the design and manufacture of robots from folded sheets of novel “smart” materials, such as the composite plastic, the metallic glass, and various soft polymers including continuum materials and fabrics. These folded robots can meet the demand for an economical robotic platform for both commercial and research applications. By combining this new methodology with biologically inspired designs, robot performance can be improved to an extraordinary degree, even better than the performance of natural organisms that have evolved unbelievable mechanical abilities