

Bio-Bots: Biological Robots Having Live Cells and Microbes as Components of a Robot

Harry Asada - asada@mit.edu

Abstract

Following the first successful workshop at the 2011 ICRA, we would like to extend the Bio-Bots workshop for the 2012 ICRA with a renewed scope. Our shared view in this workshop is that breakthroughs in bio-artificial muscles, biosensors, and synthetic biology are providing components usable for building biological robots. Bacteria-propelled micro-nano robots have already been built, having significant impacts upon medicine and biology. Technologies for culturing cells and tissues to produce novel sensors, actuators, and processors have also been developed, which can be integrated into micro-nano robots for advanced applications. The boundary between biology and robotics is being fused in this emerging field. The objective of this workshop is to display the state-of-the-art of Bio-Bots, discuss key technologies and challenges, and address system-level issues, applications, and opportunities. We will also address educational issues: how we can best educate students who will work in the field where engineering and biology are seamlessly integrated. Nine speakers from the robotics community have already been confirmed. A few more speakers from synthetic biology and tissue engineering will be invited to promote cross-disciplinary communications.