Building Biologically Inspired Robots

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CURRENT RESEARCH

Drawing inspiration and understanding from animal movement and translating this into fluid movement in robotics

Animals are proven masters of dexterous movement. Despite the ease with which they control their actions, engineers are currently unable to recreate the same fluid animal movements in robots. Dr. Noah Cowan, Associate Professor of Mechanical Engineering at Johns Hopkins University, draws on his juggling skills and his interest in how animals maneuver through space to understand *neuromechanics*, the basic *neural* and *mechanical* fundamentals of movement. He studies a diversity of animal species— from insects to humans—to better understand a wide range of sensory systems, body dynamics, and neural control systems. By understanding the general principles of movement and control in multiple species, Dr. Cowan's innovative research yields profound insight that transcends any single organism. His advanced neuromechanical systems can be applied to novel engineering designs and open the door to new technology that will largely improve life.

By designing new engineering approaches for gathering data on natural motor control systems, Dr. Cowan applies biological discovery to confer robust, stable movement to robotic systems. He trains his students in both robotics and biology, enabling them to readily translate their biological discoveries to robotic systems. Their work results in robotically engineered systems with some of the same incredible mobility enjoyed by animals. Robots that move and interact with the world as well as animals will revolutionize a variety of fields, including agriculture, elderly care, disaster recovery, and entertainment. Beyond robotics, studying how movement emerges from a conversation between the brain and body offers promising potential for understanding and...

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AFFILIATION

Johns Hopkins University

EDUCATION

- B.S., in Electrical Engineering, 1995 , Ohio State University
- M.S., in Electrical Engineering and Computer Science, 1997 , University of Michigan, Ann Arbor
- Ph.D., in Electrical Engineering and Computer Science, 2001 , University of Michigan, Ann Arbor

AWARDS

- The Dunn Family Award, 2014
- Scholar Award in Complex Systems Science, 2012
- Presidential Early Career Award in Science and Engineering, 2010
- CAREER Award, 2010
- William H. Huggins Excellence in Teaching Award, 2005

RESEARCH AREAS

Health IT, Technology, Robotics, IOT, Devices, Data

FUNDING REQUEST

Your contributions will be directed toward purchasing equipment and supplies necessary for measuring neurological and mechanical activity and computer software and hardware for analyzing that data. Most importantly, your contributions will support the training of junior transdisciplinary scientists, graduate and post-graduate students, who are crucial to this research.