Designing and Developing Novel Bionic Limbs

Hugh Herr

Associate Professor, Media Arts and Sciences

CURRENT RESEARCH

Exploring innovative technology to promote optimal comfort and eradicate disability

In the U.S. alone, millions of people suffer from a loss of functionality to their limbs. These disabilities can be caused by stroke, spinal cord injury, peripheral nerve damage, cerebral palsy, multiple sclerosis, or amputation. Dr. Hugh Herr, Associate Professor of Media Arts and Sciences at Massachusetts Institute of Technology (MIT), advances fundamental science and technology by developing bionic devices that not only emulate biological function, but augment human physicality. He explores the interplay between biological science and design, developing biohybrid "smart" bionic limbs that are significantly more powerful than current human rehabilitation technologies.

Dr. Herr's biomechatronics group of research scientists, postdocs, graduate and undergraduate students has authored more than 150 peer-reviewed manuscripts and patents, highlighting Dr. Herr's many scientific and technological innovations. They collaborate with other research labs—including researchers at the University of Michigan and the University of Colorado—to pioneer novel research in the fields of biomechanics and biological motion control.

Their novel research results accelerate the merging of body and machine, significantly improving the quality of life for persons having limb conditions. Two of their commercialized technology includes a prosthetic ankle-foot prosthesis called the BiOM, and a knee prosthesis called the Rheo. Compared to typical prostheses, their bionic systems are more powerful, intelligent, sentient, and adaptive to the human user. Through a comprehensive understanding of human morphology and dynamics, their designers are better able to fabricate unique synthetic and biologic interventions for the...

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AFFILIATION

Massachusetts Institute of Technology

EDUCATION

- Ph.D. in Biophysics, 1998,Harvard University

AWARDS

- Blouin Creative Leadership Award, 2015
- 41st Annual Inventor of the Year Award
- R&D Magazine's Innovator of the Year, 2014
- Smithsonian American Ingenuity Award in the Technology Category, 2014
- Prince Salman Award for Disability Research, 2014
- and 2 more...

RESEARCH AREAS

Technology, Computational Sciences / Mathematics, Electronics / Sensors, Robotics

FUNDING REQUEST

Your contribution will help fund Dr. Herr and his biomechatronics group of about 50 members continue their research toward eradicating disabilities and device discomfort. The innovative technology they design and develop work to improve the lives of all. Your donations will support the group's annual budget of approximately $1.9M, which covers salaries, materials, and fabricated equipment. Support the development of improved mechanical, dynamic, and electrical interfaces; fund Dr. Herr.