



MECHANICAL ENGINEERING SEMINAR

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Robotics and AI: Pillars of the next Generation of Rehabilitation Agricultural, and Industrial Robotics

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Hosted by: Dr. Nili Krausz

The foundation of human-robotic collaboration is on solid footing and nearly here. In this talk, I will discuss four on-going projects in The77Lab (MIT-Mechanical Engineering) related to developing simple tools to augment humans, to agricultural robotics (selecting better quality seeds), to digital transformation (training novice operators), to rehabilitation robotics (delivering movement therapy and evaluating outcomes). A key aspect to highlight among these examples is the dynamic nature of human-robotic collaboration. Many of us design(ed) fabulous machines and expect(ed) humans to get entrained into their use, while others attempt(ed) to have robots understand human intentions and entrain them to humans. Both of these visions are very useful but somehow "static." It might be better to focus on "dynamic" change: as humans learn how to use robots, robots should adapt their behavior, which will lead to further human adaptation and so on. Another aspect to consider when examining human-robot collaboration is that "moonshots," as for example fully autonomous vehicles operating in complex variable environments, are exciting but alternative approaches that include the human-in loop might be achievable in shorter order and significantly impact the march of progress. Fundamental to human-robotic collaboration is the expertise into fusing AI and robotics, so that robots can then properly and truly interact and manipulate the world.

Dr. Hermano Igo Krebs is a Principal Research Scientist at MIT's Mechanical Engineering Department and the Director of The77Lab (<https://the77lab.mit.edu/>). He holds affiliate positions as a Visiting Professor at Fujita Health University, Department of Physical Medicine and Rehabilitation; at The University of Osaka, Mechanical Science and Bioengineering Department; and at Keio University, System Design Engineering Department. He is a Fellow (Class of 2014) and a Life Fellow of the IEEE. He received the 2015 IEEE-INABA Technical Award for Innovation leading to Production "for contributions to medical technology innovation and translation into commercial applications for Rehabilitation Robotics." He was one of the founders and the Chairman of the Board of Directors of Interactive Motion Technologies from 1998 to 2016. He successfully sold it to Bionik Laboratories, a publicly traded company. He later founded 4Motion Robotics.

