



MECHANICAL ENGINEERING SEMINAR

Monday, July 3rd, 2023, at 14:30, D. Dan and Betty Kahn Building, Auditorium 1

Designing Bio-Inspired Robots: The Influence of Actuation Level on Performance

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Hosted by: Assoc. Prof Yizhar Or

Bio-inspired robots have a wide range of uses in fields such as medicine, search and rescue, maintenance, surveillance, security, space exploration, agriculture, animal learning, hazardous area investigation, and more. The robots we develop at our lab draw inspiration from the natural world (bio-inspiration) but incorporate available technologies and minimalist design. This means they integrate a small number of rotational motors as opposite to a large number of muscles and tendons in animals and insects. Over the years, we have built several robotic platforms with innovative designs that enable crawling, driving, and flying in various environments. Examples include reconfigurable robots that can crawl on challenging surfaces (also changing their size), "snake" track robots that adjust their shape to overcome obstacles, minimalist flying driving drones, wave-like robots that can swim and crawl, and more...

In this talk, we will present the impact of minimalistic actuation on enhancing performance in robotics and explore new actuation concepts that hold the potential to address specific challenges. By reducing the number of actuators and incorporating minimalist approaches, we can reduce the weight and size, improve energy efficiency, and enhance the robots' overall mobility and maneuverability. During the talk, we will showcase some examples of these new designs and discuss their potential applications.

Dr. Zarrouk is an Associate Professor at the Mechanical Engineering department of Ben Gurion University of the Negev and director of the "Bio-inspired and Medical Robotics" Laboratory. He received his M.Sc. in 2007 (in stochastic mechanics) and Ph.D. in 2011 (in medical robotics) from the faculty of Mechanical Engineering at the Technion. Between Aug. 2011 and Oct. 2013, He was a Fulbright postdoctoral scholar at the EECS Dep. of U.C. Berkeley, working on miniature crawling robots. His research interests are in robotic design, bio-inspired and miniature robotics, flexible and slippery robot-to-surface interaction, space robotics, minimally actuated mechanisms, and medical devices. Dr. Zarrouk received multiple prizes in teaching, research, and innovation.

The seminar will be given in English