

## סמינר - SEMINAR

הנך מוזמנת/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 27.04.2017 (א' באייר, תשע"ז), בבניין דן קאהן, אודיטוריום 1, 13:30.

ירצה:

### Asst. Prof. Shai Revzen

Electrical Engineering and Computer Science  
and Ecology and Evolutionary Biology  
Ann Arbor, MI, U.S.A

על הנושא:

## Seeking simple models for multilegged locomotion: hybrid oscillators, rapid manufacturing, and slippage

The seminar will be given in English

להלן תקציר ההרצאה:

Most terrestrial animals massing several grams or more use more than two legs to move. Despite injury, aging, and disease; in the face of unknown and unstable substrates – animals often achieve their locomotion objectives. We seek a theory of animal motion that would allow us to design such robust locomotion into robotic systems. One candidate is oscillator theory. Viewed from its lens, rapid legged locomotion can be seen as a hybrid oscillator, or a collection of phase locked hybrid oscillators. Our recent theoretical advances allow us to analyze the stability of a large class of such hybrid oscillators, and demonstrate that by exploiting the hybrid structure they obtain robustness, and allow for modularity by requiring low communication complexity. Our new construction methods, based on modular robotics, have allowed us to rapidly build, test and evolve robot designs. Our quantitative analysis of the robot motions teaches us that we require better models for multi-contact slippage if the motions of our hexapedal robots are to be understood.

Bio : Shai Revzen is an Assistant Professor in the departments of Electrical Engineering and Computer Science and of Ecology and Evolutionary Biology in the University of Michigan, Ann Arbor. He holds a PhD from the University of California, Berkeley in biomechanics, an MSc in computer science from the Hebrew University in Jerusalem, and did his post-doctoral work in the GRASP lab of the University of Pennsylvania. His BIRDS (Biologically Inspired Robotics and Dynamical Systems) Lab in Michigan focuses on problems of legged locomotion from an oscillator theory perspective, and on the crucial role of mechanics in robot dynamics. He aims to extract core principles of biological robustness and control in mathematical form and recast them into robots. In addition, Shai has worked on the rapid manufacturing of robots and robotic mechanisms. His work has been published in engineering, biology and applied mathematics journals. Shai is also a co-founder of a company developing novel electrocardiac diagnostics, is the author of several patents, and has extensive experience from over a decade in the tech industry in both Tel-Aviv and Silicon Valley.

בברכה,

המארח: פרופ"מ יזהר אור

פרופ"מ שואל אוסובסקי  
מרכז הסמינרים