

סמינר - SEMINAR

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום די 17.04.2019 (יייב בניסן תשעייט), בניין דן קאהן, חדר 217, 30 .12:

<u>מרצה:</u>

Dr. Avishai Sintov

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:על הנושא

Planning and control for low-cost robotic manufacturing

The seminar will be given in English

להלן תקציר ההרצאה:

In today's manufacturing plants, robots are the foundational element of high volume automation and are used extensively in various operations. Manufacturing plants have to juggle two critical and often conflicting requirements: the greater demand and the higher quality. This requires manufacturing high quality products while meeting a very high production rate. The robots interact with the objects by using an arm and an end-effector that is a key interface between the robot and the component or product that needs to be handled. The robot arms are built for multi-purpose tasks. While many end-effectors look similar to one another; they are designed, built, and optimized for a specific task and specific part geometry. This makes them very inflexible in handling variations in component shape or the task. Thus, a typical end-effector consumes a considerable amount of engineering time and adds extra cost to the final product.

In this talk I will address this problem with two distinct approaches. In the first part, I will discuss motion planning for Dynamic Regrasping to alternate grasp configurations of the object with respect to the task to be done. I would talk about two types of dynamic regrasping manipulations using a robotic arm and a simple non-dexterous gripper. Thus, the same arm can grasp multiple parts and perform multiple operations on the same part, and by that, decrease the number of robotic arms in the plant.

The second part of the talk will focus on 3D-printed under-actuated hands. Such hands are appealing but present challenges due to the difficulty of acquiring analytical models. I will discuss advanced approaches for control and motion planning to perform in-hand precise manipulation. By learning a stochastic state transition model of the hand, model-based reinforcement learning and belief space planning can be utilized for robust motions, allowing high dexterity and low costs.

Bio: Avishai Sintov received his B.Sc., M.Sc. and Ph.D. degrees in Mechanical Engineering from Ben-Gurion University of the Negev, in 2008, 2012 and 2016, respectively. There, he was also a lecturer and a teaching assistant. Currently, he is a Post-doctoral research associate in the Department of Computer Science at Rutgers University. Previously, he was a post-doctoral research fellow in the Coordinated Science Laboratory at the University of Illinois at Urbana-Champaign. His interests include motion planning, grasping and regrasping synthesis, dynamic manipulations, machine learning and robot design.

<u>מארח:</u> פרופי אולג גנדלמן

בברכה,