סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ד׳ 19.08.2020

(כ״ט באב, תש״פ), בשעה 11:30 באמצעות הזום :

https://technion.zoom.us/j/99771147623

Meeting ID: 997 7114 7623

מרצה: אורן ספקטור

מנחה: פרופ׳/ח מרים זקסנהויז

על הנושא:

Learning Contact Rich Skills Using Coupling Movement Primitives

The seminar will be given in Hebrew

תקציר ההרצאה :

In recent years, industrial robots are being installed in various industries to handle advanced manufacturing and high precision tasks. However, further integration is hampered by the limited flexibility, adaptability and decision making skills of current robots compared to human operators.

Assembly tasks are especially challenging for robotic operation since they are contact rich and sensitive to even small uncertainties.

While reinforcement learning offers a promising framework to learn contact rich control policies from scratch, its applicability to high-dimensional continuous state-action spaces remains rather

limited due to high brittleness and sample complexity. To address those issues, we propose different pruning methods that facilitates convergence and generalization. In particular, we divide the task into known and unknown parts, perform the control in Cartesian rather than joint space, and parameterize the control policy.

We further show that our pruning techniques can be easily implemented using dynamic movement primitives (DMP) framework with an additional coupling term that acts like the human wrist and provides active compliance under contact with the environment. We demonstrate that the proposed method can learn insertion skills that are invariant to space, size and shape, while handling large uncertainties and transferring well to similar operations. Finally we demonstrate that the learned policy can be easily transferred to a real robot with similar performance.

בברכה,

פרופ"א אתי סאס

מרכז הסמינרים