Robotic Surgical Skill Evaluation and Acquisition

Yarden Sharon

Department of Biomedical Engineering, Ben-Gurion University of the Negev

Robot-assisted minimally invasive surgery (RAMIS) has many advantages over open surgery. However, surgeons must be well trained to use the robotic systems to reap the benefits of RAMIS. Many efforts have been invested in optimizing the way RAMIS surgeons acquire technical skills, but the knowledge of how to measure technical skills and optimize training protocols is still limited. The goal of my Ph.D. study is to improve the way surgeons acquire RAMIS skills by (1) developing surgical skill metrics to evaluate the current state of a surgeon; (2) developing and testing novel training protocols in which we implement force and motion interventions to enhance learning; and (3) modeling the progress of trainees throughout long-term training. In this talk, I will present the results of two experiments that tested the effect of adding periodic force and motion perturbations on learning a robotic surgical pattern-cutting task. Afterward, I will present our work on developing orientation-based metrics for surgical skill evaluation. Finally, I will describe the protocol design and the collection of a dataset for modeling long-term skill acquisition in robotic surgical training tasks.

About the speaker:

Yarden Sharon received her B.Sc. degree in Biomedical Engineering from Ben-Gurion University of the Negev, Israel, in 2016. She is currently a Ph.D. student in the Biomedical Robotics Lab at the Department of Biomedical Engineering, Ben-Gurion University of the Negev, Israel. Her research interests are surgical robotics, computational motor control, and surgical skill evaluation and acquisition.