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Title: Errors in Long-Term Robotic Surgical Training

Abstract: Robotic surgeries offer many advantages but require surgeons to master complex motor tasks over years. Most motor-control studies focus on simple tasks and span days at most. To help bridge this gap, we followed surgical residents learning complex tasks on a surgical robot over six months. In this work, we focus on the task of moving a ring along a curved wire as quickly and accurately as possible. We wrote an image processing algorithm to locate the errors in the task and computed error metrics and task completion time. We found that participants decreased their completion time and number of errors over the six months, however, the percentage of error time in the task remained constant. This long-term study sheds light on the learning process of the surgeons and opens the possibility of further studying their errors with the aim of minimizing them.

Bio: Hanna Kossowsky Lev is a PhD student in Prof. Ilana Nisky's lab in the department of Biomedical Engineering. She received her B.Sc and M.Sc degrees in biomedical engineering from Ben-Gurion University in 2019 and 2022, respectively. Her research interests include haptics and the use of deep learning methods in the analysis of robot-assisted surgeries. She was the recipient of the Lachish, ABC Robotics, and Ariane de Rothschild fellowships.