Dr. Guy Rosman

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Abstract:

We envision a world of ubiquitous robotics, with devices that operate for long periods of time, and adapt to many different tasks and environments. The long duration of operations and variety of tasks require us to summarize the history of the robot in an efficient manner.

Consider for example a robot that collects a video feed for a week, and has to quickly answer questions such as “Have I been here before?” and “Can I easily drive on this road?”.

What intermediate representations and algorithms can enable robots to use historical data in a versatile and efficient manner? I will describe a new coreset algorithm for summarizing visual data towards search, retrieval, and large-scale learning.

Another current limitation of robotic perception is that sensors operate in a fixed manner, regardless of the task or world state estimate. In the second part of the talk I will discuss a new approach for information-driven 3D sensing, using adaptive time-multiplexed structured light. I will show how to optimally choose projector patterns for these scanners based on focused information maximization. This allows us to adapt 3D scanners towards different tasks, such as mapping and localization, or obstacle avoidance.

Biography:

Guy Rosman is a post-doctoral researcher at MIT / CSAIL, where he received the Technion-MIT post-doctoral Fellowship and is working with the Distributed Robotics Lab and the Sensing, Learning and Inference group. His research interests include 3D sensing in robotics and computer vision, as well as inference and machine learning techniques. His past works explore structure and motion estimation from visual sensors, and the role of different optimization and inference techniques in computer vision.

He obtained in 2004 his BSc Summa Cum Laude, in 2008 MSc Cum Laude, and in 2013 PhD at the Technion (with the Jacobs-Qualcomm fellowship), in the Computer Science Department. He has worked at several companies, including IBM research, RAFAEL Ltd., Medicvision, and Invision Biometrics (now Intel Realsense).