Department of Computer Science, The University of Hong Kong

CS Seminar

Zoom Research Seminar

Making Sense of the Physical World with High-resolution Tactile Sensing

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Carnegie Mellon University

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(GMT+8)

Zoom link: https://hku.zoom.us/j/99996676391

Abstract:

With the rapid progress in robotics, people expect robots to be able to accomplish a wide variety of tasks in the real world, such as working in factories, performing household chores, and caring for elderly. However, it is still very difficult for robots to act in the physical world. A major challenge lies in the lack of adequate tactile sensing. Progress requires advances in the sensing hardware, but also requires advances in the software that can exploit the tactile signals generated when the robot touches an object. The sensor we use is a vision-based tactile sensor called GelSight, which measures the geometry and traction field of the contact surface. For interpreting the high-resolution tactile signal, we utilize both traditional statistical models and deep neural networks.

I will describe research on two kinds of tasks: exploration and manipulation. For exploration, I use active touch to estimate the physical properties of the objects. The work has included learning the basic properties (e.g., hardness), of artificial objects, as well as estimating the general properties of natural objects via autonomous tactile exploration. For manipulation, I study the robot's ability to detect slip or incipient slip with tactile sensing during grasping. My research helps robots to better understand and flexibly interact with the physical world.

About the Speaker:

Wenzhen Yuan is an assistant professor in the Robotics Insititute (RI) at Carnegie Mellon University. She received her PhD and Master degree from MIT, supervised by Prof. Edward Adelson and Dr. Mandayam Srinivasan. She received her BE degree from Tsinghua University. She also worked as a postdoctoral researcher at Stanford University. Her research interest is in tactile sensing, robotic perception and manipulation, and soft robotics.

All are welcome!
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