学术报告会

时间：**2023年4月18日 10:00-11:00**
地点：**电信群楼2-410会议室**

Teach Robot to Use Chopsticks: a Test Bed for Robotic Learning via Fine Manipulation

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摘要:

Fine manipulation—cutting fingernails, threading a needle, or detaching clots from organs—is prevalent in everyday life. Developing robotic systems to automate these tasks holds immense economic potential. Chopsticks, being simple and versatile tools, offer an ideal platform for investigating the challenges associated with precision control and adaptability in robotic fine manipulation.In this talk, I will present a series of works that enable a general-purpose robot arm, equipped with chopsticks, to tackle high-precision manipulation challenges in the real world. First, we create an accessible test bed by designing an assembled robotic arm with a custom end-effector featuring chopsticks. Next, we develop algorithms for collecting and leveraging human supervision (e.g., demonstrations) to achieve the precision required for fine grasping tasks through imitation learning. Furthermore, we design a practical system allowing the robot to enhance its robustness in a self-supervised manner using reinforcement learning. Finally, I will propose several future directions to improve the sample efficiency and generalization of this system.

简介:

Liyiming Ke is a final-year Ph.D candidate at the University of Washington, specializing in robotics learning. Her research endeavors to expand the theoretical boundaries of imitation learning and reinforcement learning, while also exploring practical real-world applications. She has developed a low-cost chopsticks robot platform capable of fine manipulation and grasping in dynamic environments, even without an accurate model. She has seven first-author publications presented at top-tier conferences and served as a reviewer for international journals and conferences such as IROS, ICRA, RAL, IJRR, and ICLR. She has research internships at Facebook AI Research and Microsoft Research. She has also led a human-robot interactive demonstration at AAAS gathering.