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Automatic
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The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

“Robot Manipulation: Beyond Pick-and-Place”

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Wednesday, 20 March 2019 at 14:00

LT2, The Diamond

Abstract

There are striking differences between human manipulation capabilities and state-of-the-art robotic manipulation. First, we humans are capable of a wide variety of manipulation skills, e.g. pushing, pulling, throwing, and tumbling the objects around us, whereas robotic manipulation is extremely limited, mostly to grasping actions. Second, we humans can plan and execute long sequences of manipulation actions to reach a high-level goal, such as assembling a piece of furniture, whereas robots are limited in their planning and execution capabilities constraining them to short sequences of simple pick-and-place operations. In this talk I will present my research addressing these limitations of robotic manipulation. First, I will focus on using physics-based reasoning to add to a robot's repertoire of manipulation skills. Particularly, I will talk about using pushing actions in environments with multiple objects and multiple contacts. Second, I will talk about planning long sequences of manipulation actions for multi-robot and human-robot teams. Particularly, I will talk about planning for forceful assembly/manufacturing actions such as drilling, cutting, and fastening collaboratively.

Biography

Mehmet Dogar is a University Academic Fellow at the School of Computing, University of Leeds. He leads the Robotic Manipulation Lab at the School. Previously, he was a Postdoctoral Researcher at the Distributed Robotics Group at MIT CSAIL. He received his Ph.D. from the Robotics Institute at Carnegie Mellon University in 2013. He also serves as a co-chair of the IEEE-RAS Technical Committee on Mobile Manipulation and an Associate Editor of the journal IEEE Robotics and Automation Letters (RA-L).