The 8th International Conference on

Control, Automation and Robotics (ICCAR 2022)

April 8-10, 2022 | Xiamen, China

Lecture by

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Learning for interaction in robotic tasks

Please write the abstract of your presentation here.

All day long, our fingers touch, grasp and move objects in various media such as air, water, oil. We do this almost effortlessly - it feels like we do not spend time planning and reflecting over what our hands and fingers do or how the continuous integration of various sensory modalities such as vision, touch, proprioception, hearing help us to outperform any other biological system in the variety of the interaction tasks that we can execute. Largely overlooked, and perhaps most fascinating is the ease with which we perform these interactions resulting in a belief that these are also easy to accomplish in artificial systems such as robots. However, there are still no robots that can easily hand-wash dishes, button a shirt or peel a potato. Our claim is that this is fundamentally a problem of appropriate representation or parameterization. When interacting with objects, the robot needs to consider geometric, topological, and physical properties of objects. This can be done either explicitly, by modeling and representing these properties, or implicitly, by learning them from data. The main cobjective of our work is to create new informative and compact representations of deformable objects that incorporate both analytical and learning-based approaches and encode geometric, topological, and physical information about the robot, the object, and the environment. We do this in the context of challenging multimodal, bimanual object interaction tasks. The focus will be on physical interaction with deformable and soft objects.

About the author

Danica Kragic is a Professor at the School of Computer Science and Communication at the Royal Institute of Technology, KTH. She received MSc in Mechanical Engineering from the Technical University of Rijeka, Croatia in 1995 and PhD in Computer Science from KTH in 2001. She has been a visiting researcher at Columbia University, Johns Hopkins University and INRIA Rennes. She is the Director of the Centre for Autonomous Systems. Danica received the 2007 IEEE Robotics and Automation Society Early Academic Career Award. She is a member of the Royal Swedish Academy of Sciences, Royal Swedish Academy of Engineering Sciences and Young Academy of Sweden. She holds a Honorary Doctorate from the Lappeenranta University of Technology. Her research is in the area of robotics, computer vision and machine learning. She received ERC Starting and Advanced Grant. Her research is supported by the EU, Knut and Alice Wallenberg Foundation, Swedish Foundation for Strategic Research and Swedish Research Council. She is an IEEE Fellow.