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Adaptive robotic systems using embodied intelligence

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Abstract: Current robots are primarily rigid machines that exist in highly constrained or open environments such as factory floors, warehouses, or fields. There is an increasing demand for more adaptable, mobile, and flexible robots that can manipulate or move through complex environments. This problem is currently being addressed in two complementary ways: (i) learning and control algorithms to enable the robot to better sense and adapt to the surrounding environment and (ii) embedded intelligence in mechanical structures. My vision is to create robots that can mechanically conform to the environment or objects that they interact with to alleviate the need for high-speed, high-accuracy, and high-precision controllers. In this talk, I will give an overview of our key challenges and contributions to developing mechanically conformable robots, including soft parallel mechanisms for dexterous manipulation, physically-coupled multi-agent systems, and dynamic origami.

Biographical Sketch: Zeynep Temel is an Assistant Professor with the Robotics Institute at Carnegie Mellon University. Her research focuses on developing robots that can mechanically conform to the environment or objects that they interact with. Prior to joining RI, she was a postdoctoral Fellow at the Microrobotics Lab in Harvard University. She received her Ph.D. from Sabanci University, Turkey, where her work is funded by Turkish Science Foundation. In 2020, she was selected as one of 25 members of the Young Scientists Community of World Economic Forum.

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