NRI: FND: Learning Visual Dynamics from Interaction

Pls: Carl Vondrick, Hod Lipson Columbia University

Overview of Self-Dynamics Model



We equip the robot with the ability to model its entire morphology and kinematics in 3D space only given joint angles, known as visual self-model. With the visual self-model, the robot can perform variety of motion planning and control tasks by simulating the potential interactions between itself and the 3D world. Our visual self-model is continuous, memory efficient, differentiable and kinematic aware.



Broader Impacts

- Research products are integrated into undergraduate courses in mechanical engineering and computer science courses about robotics to introduce students to computer vision and robot control perception
- Self-models will enable robots to handle more more realistic situations where situations are dynamics, such as in places of work or emergency situations
- Project provides training for two graduate students in interdisciplinary research at the intersection of mechanical engineering and computer science
- Project has provided hands-on research opportunities for two undergraduate students in computer science