

Computational and Interactive Design of Soft Growing Robot Manipulators

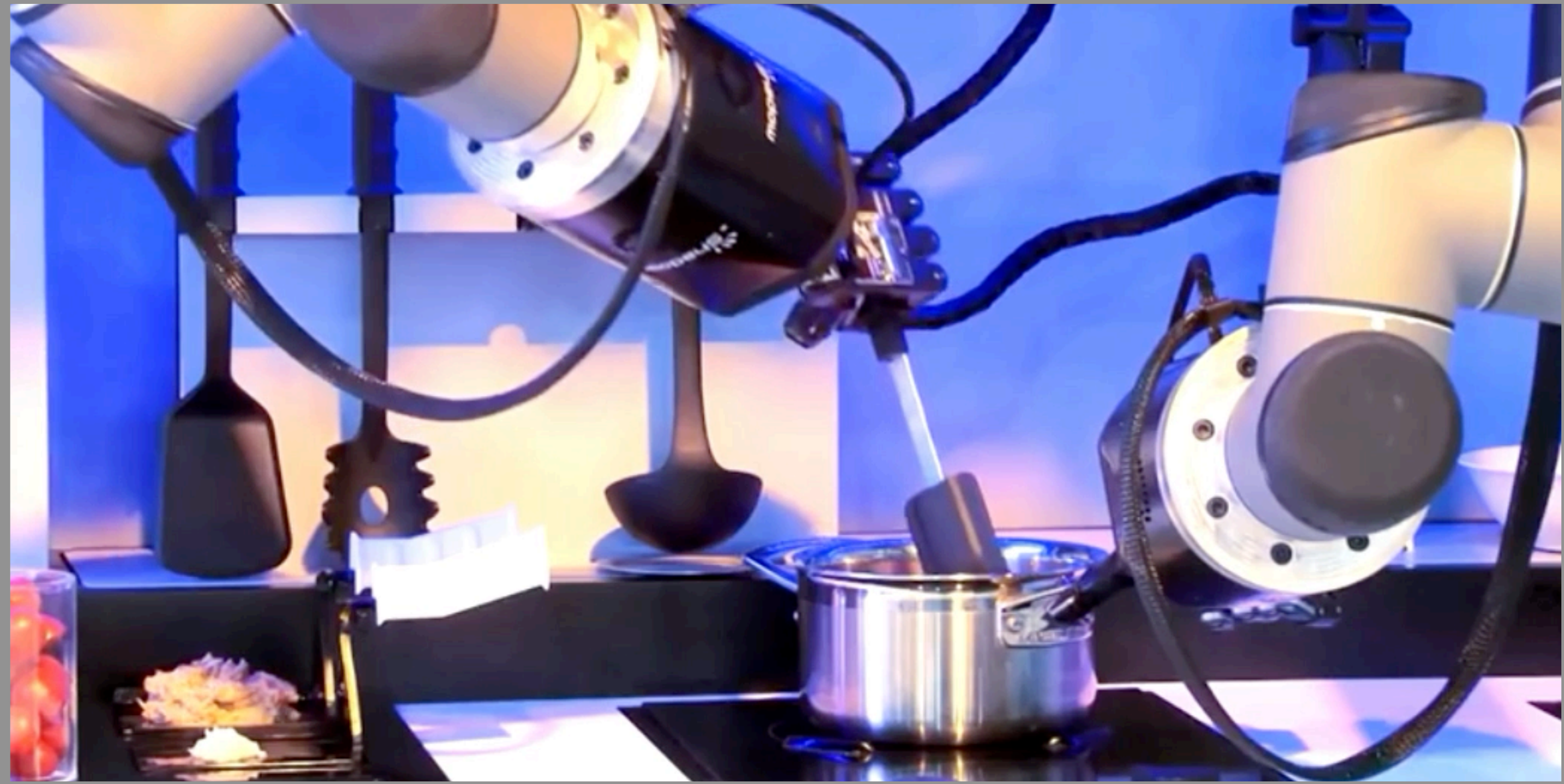
Allison Okamura and C. Karen Liu
Stanford University

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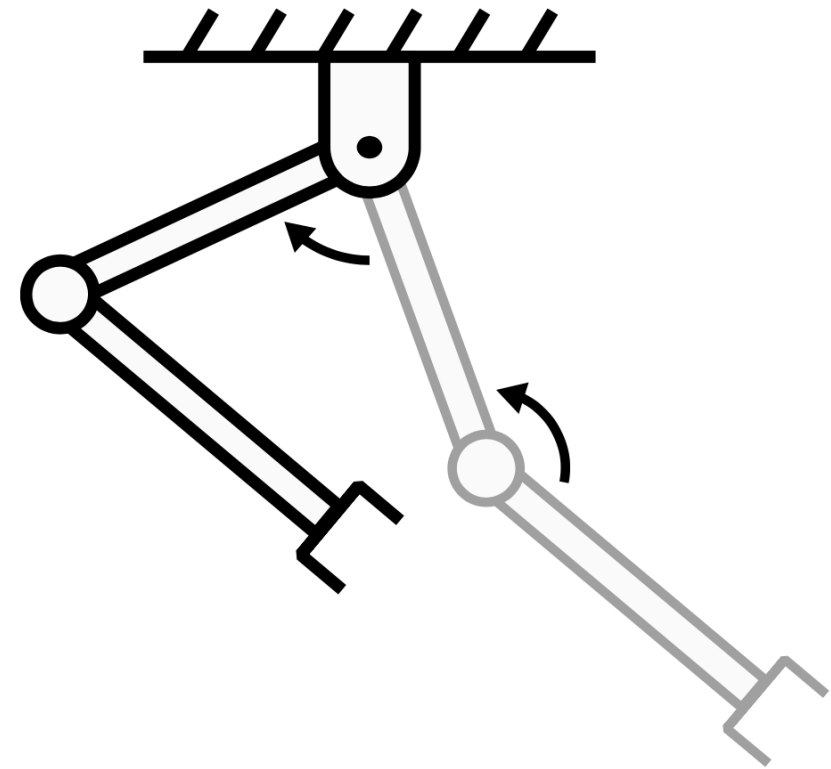


Rigid cap
→
containing camera

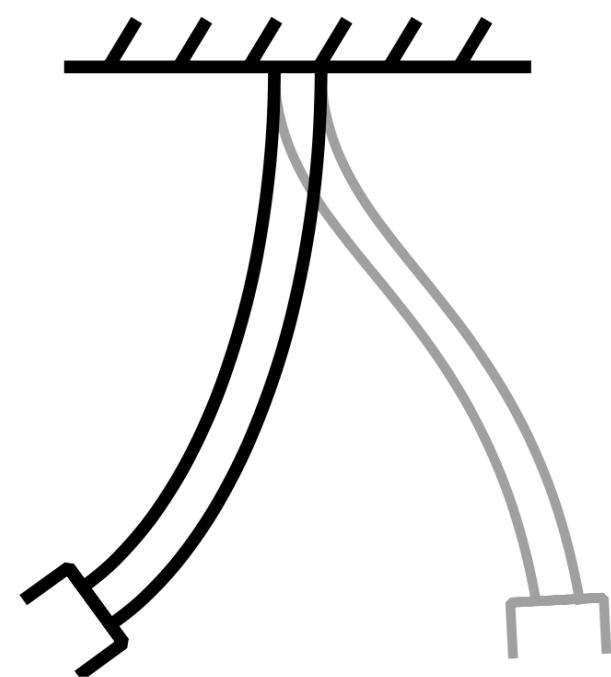




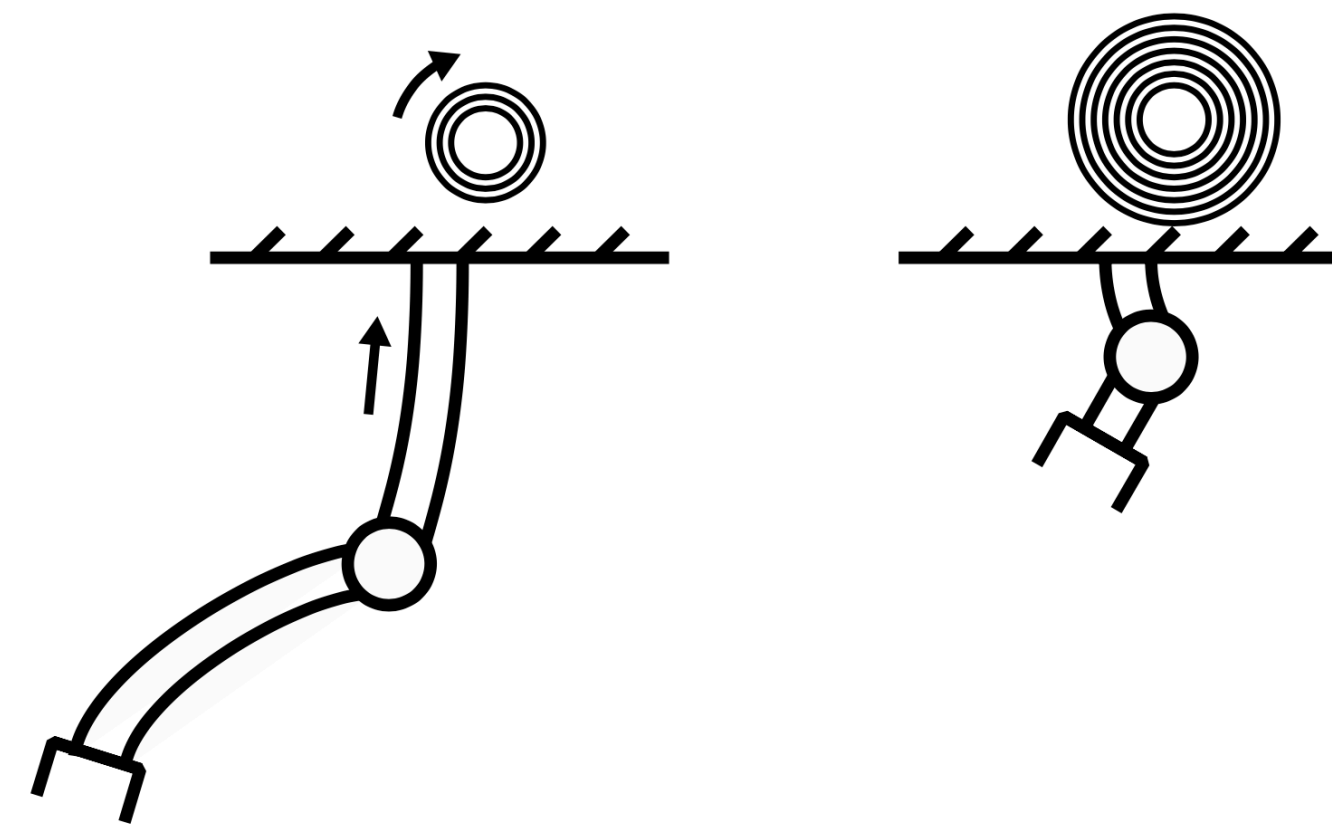
Traditional
Rigid Manipulator



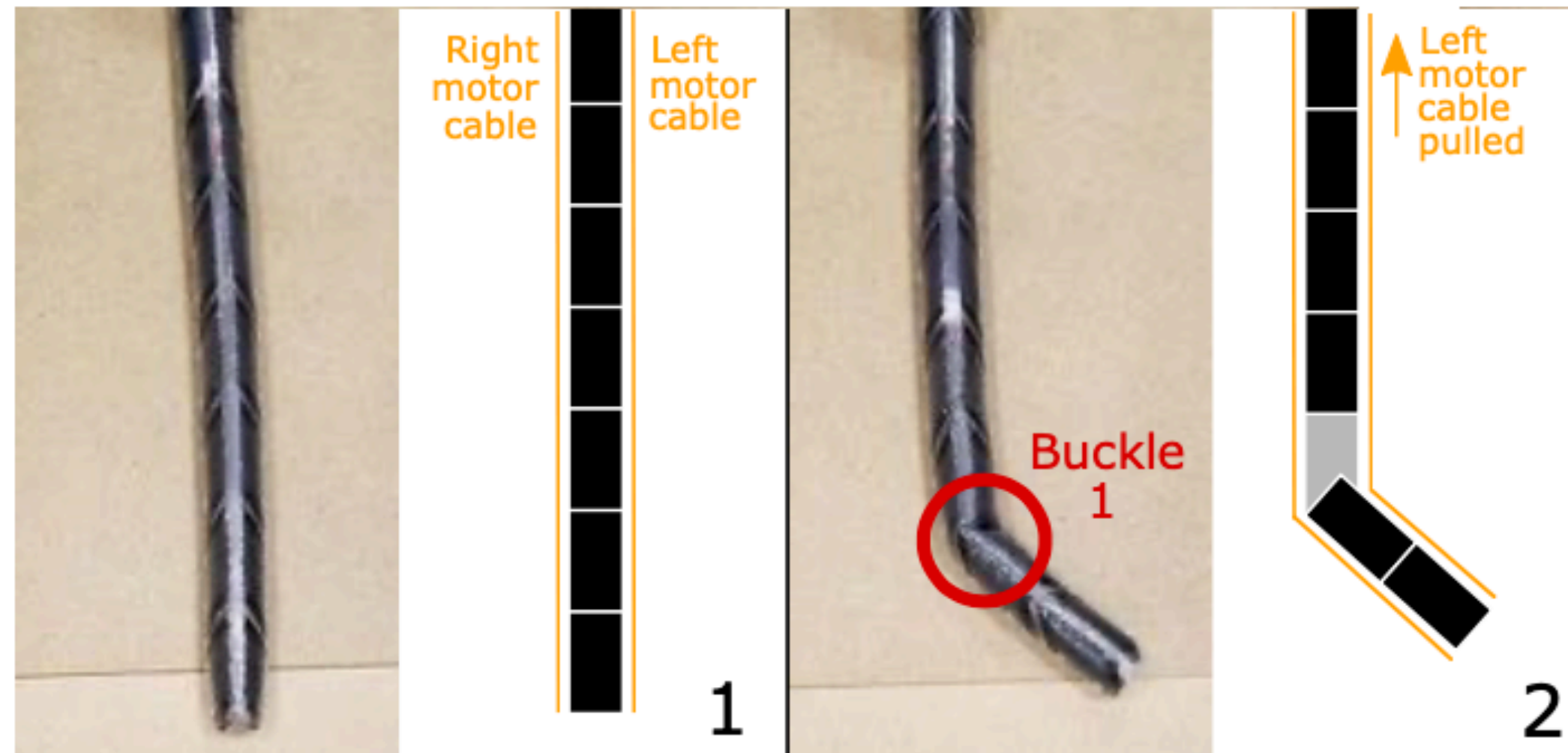
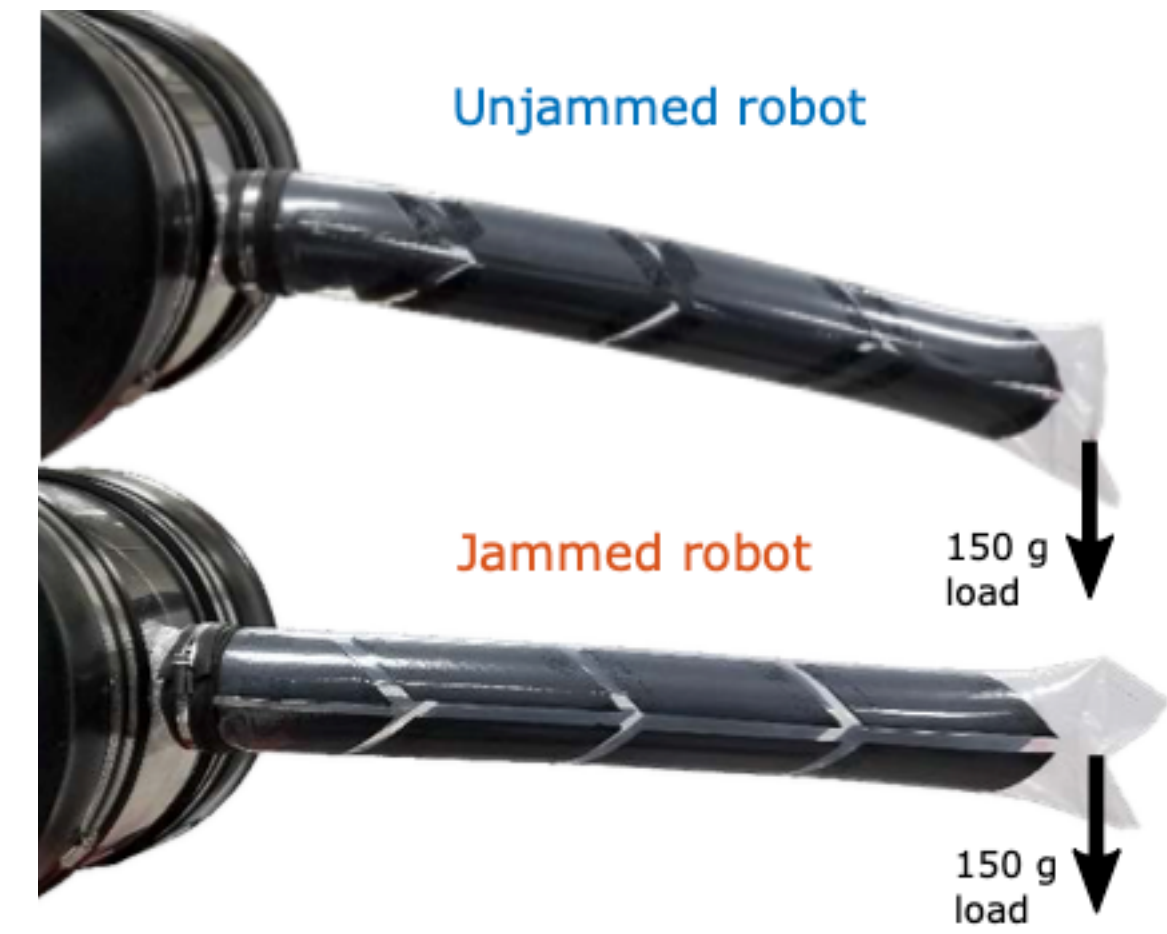
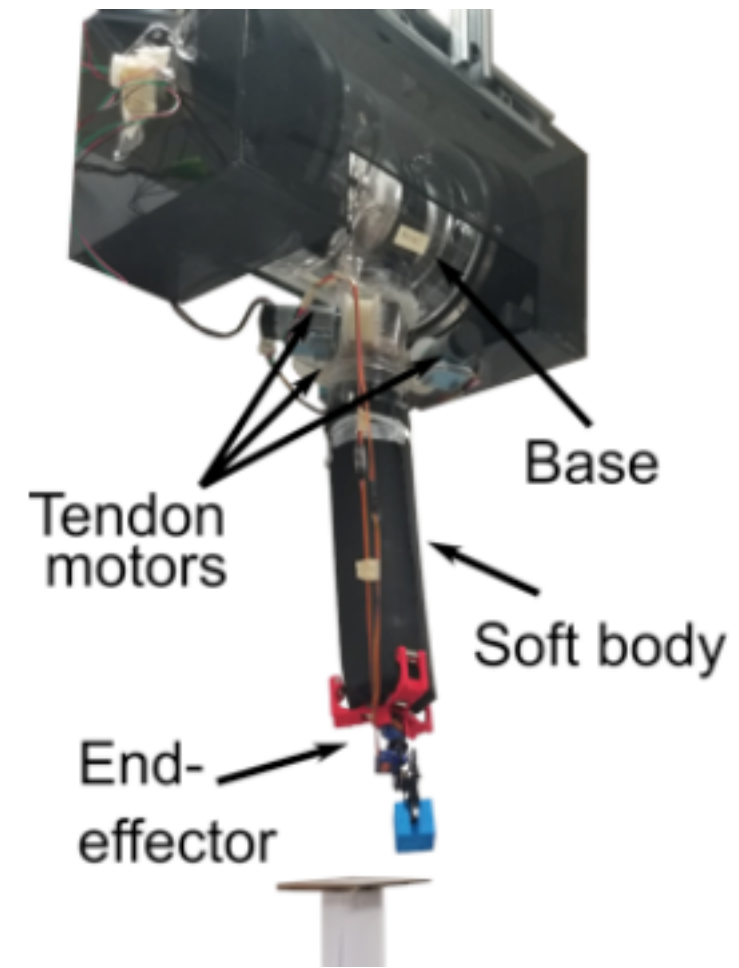
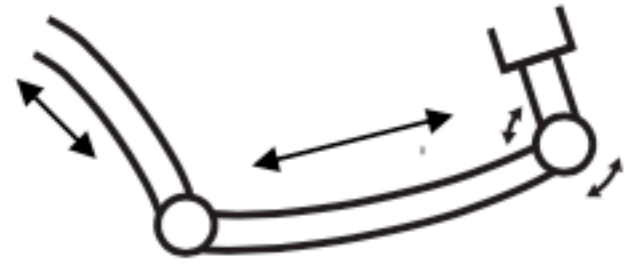
Traditional
Soft Manipulator



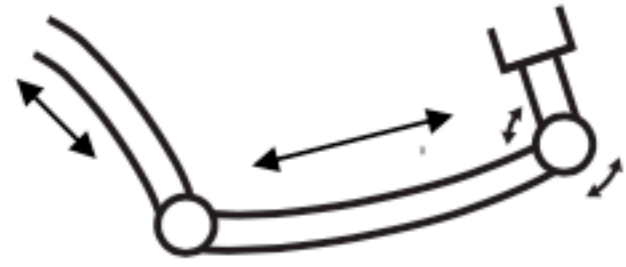
3D Soft Growing Manipulator
(with continuum links, variable stiffness
control, and variable discrete joints)



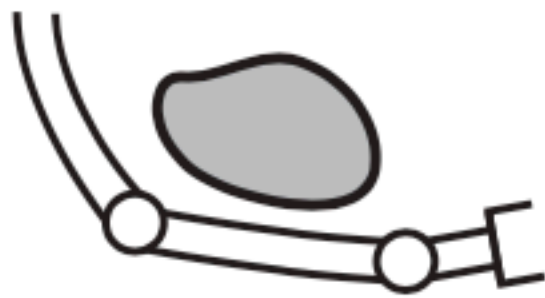
Objective 1: Mechanisms for 3D soft growing robot manipulators



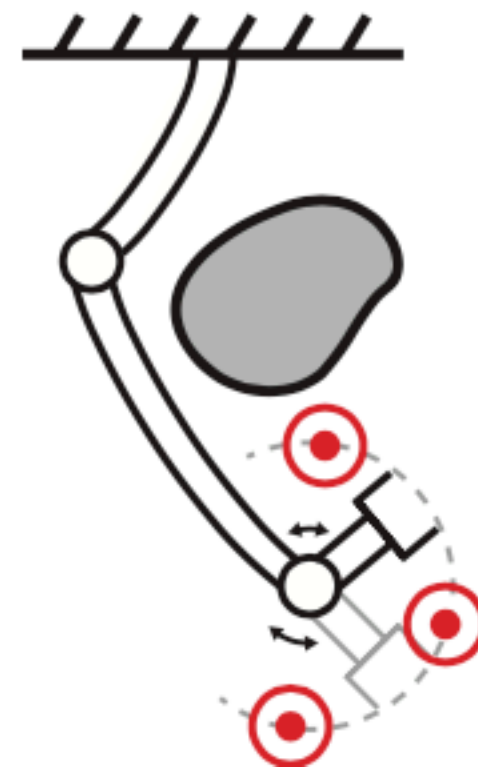
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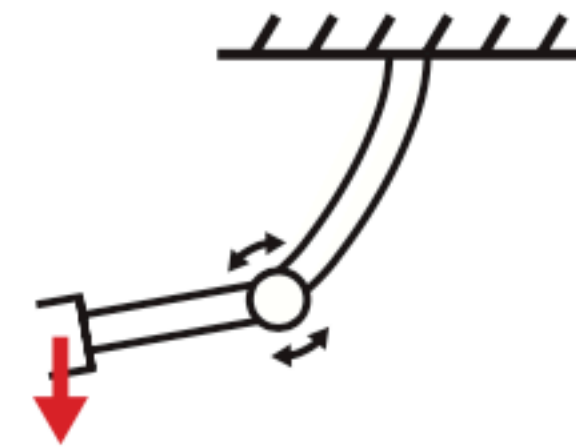
Objective 2: Simulation and planning



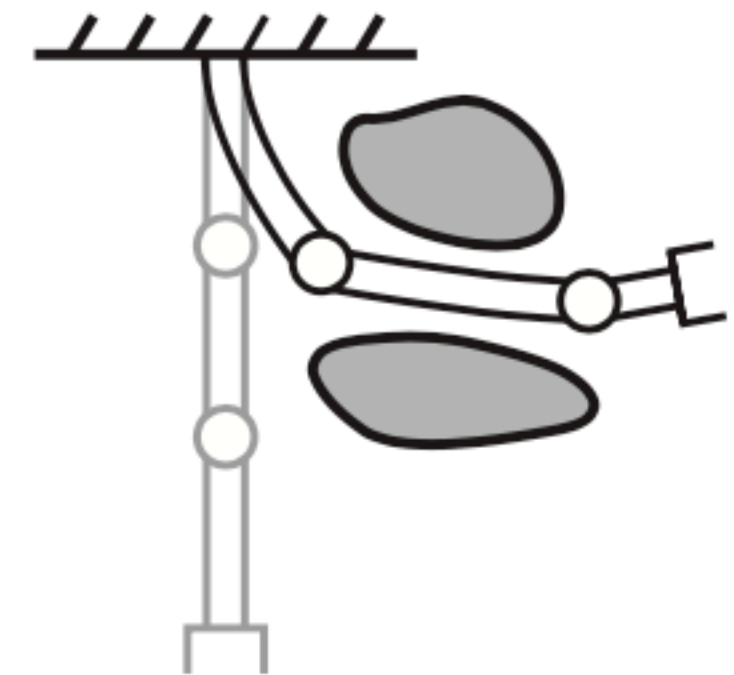
Problem 1
Inverse Kinematics



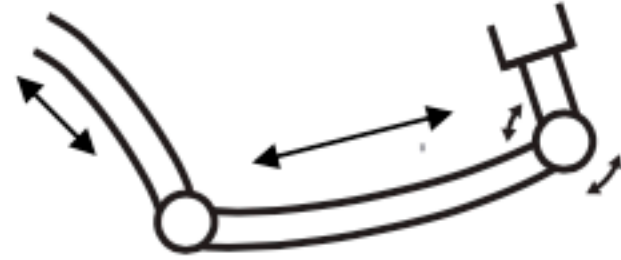
Problem 2
Inverse Dynamics



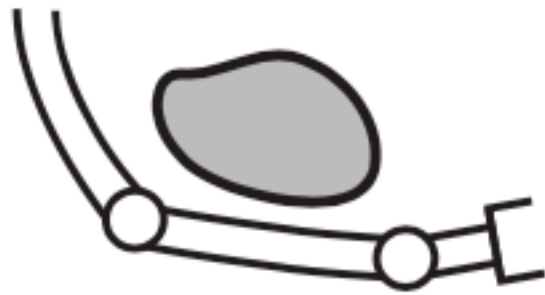
Problem 3
Trajectory Optimization



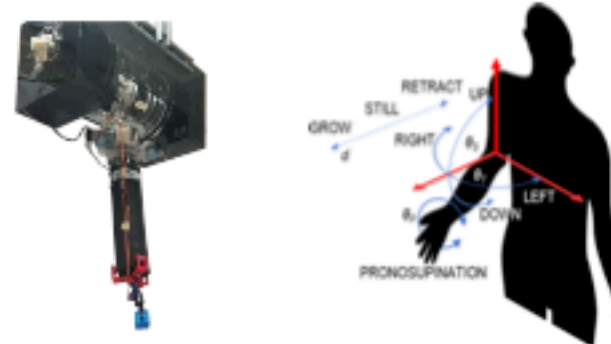
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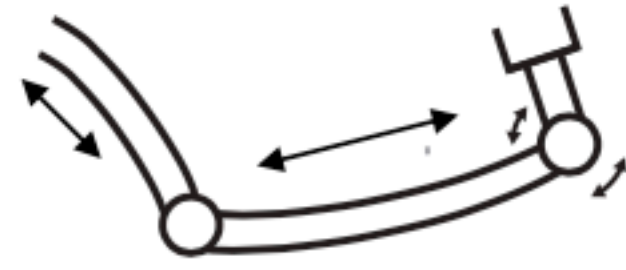
Objective 2: Simulation and planning



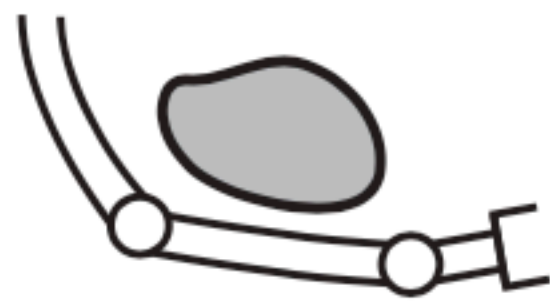
Objective 3: Interactive Design and Evaluation



Objective 1: Mechanisms for 3D soft growing robot manipulators



Objective 2: Simulation and planning



Objective 3: Interactive Design and Evaluation

