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Title: Learning control with Differentiable Simulation.

Abstract: Model-Free Reinforcement Learning (MFRL) has garnered significant attention for its effectiveness in continuous motor control tasks. High-speed simulators have enabled these Model-free methods scale performance to many complex tasks, but the limitations can sometimes be apparent in high dimensional control. Differentiable Simulation provides a unique setup whereby access to first order gradients enable attempting problems in high dimensions. We will show the utility in building a optimization based grasp discovery, show how first-order RL methods can improve efficiency and then develop a method for optimization in contact based tasks.