

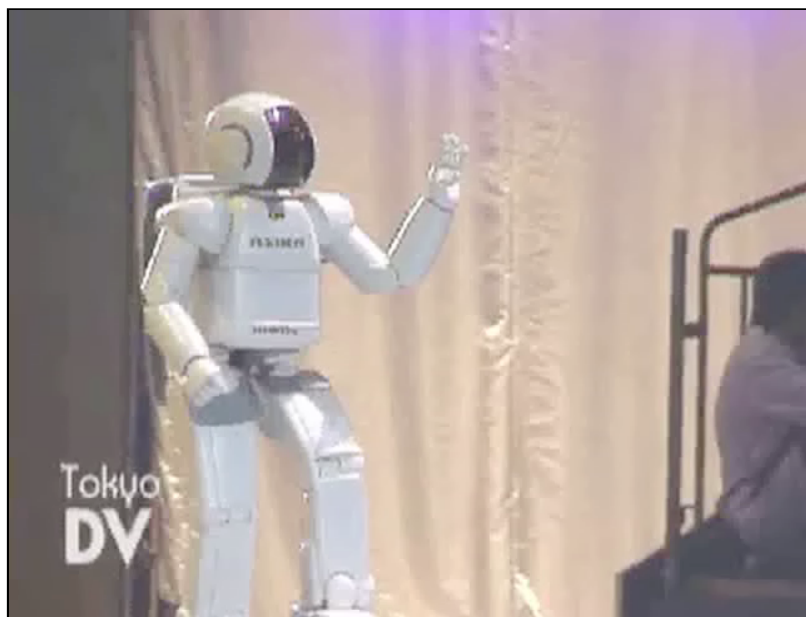
Robot Locomotion

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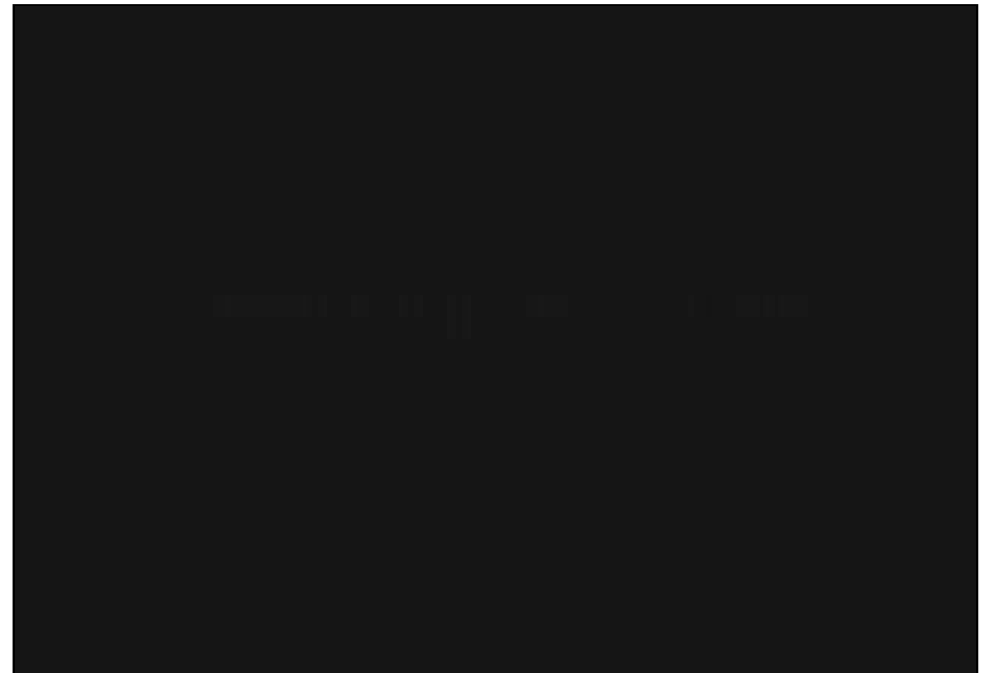
To achieve *agility*, we must first *relinquish* control



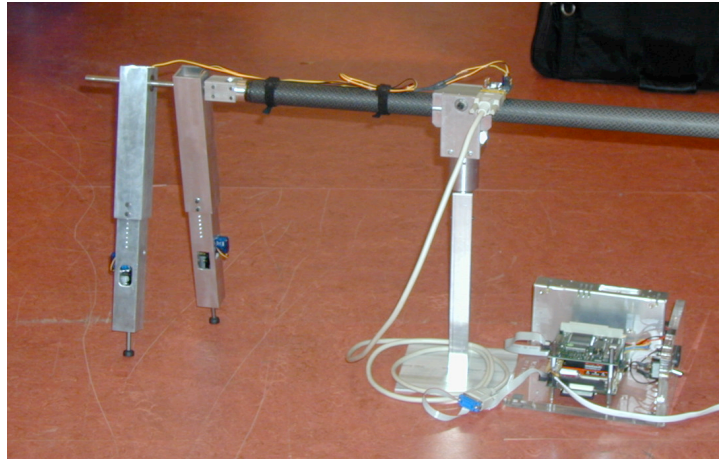


How do you add *minimal* control?

- Clever mechanical design
- Add a few actuators to push and pull natural dynamics
- *Control techniques must address:*
 - Underactuation
 - Uncertainty
- If formulated as optimal control problem, machine learning can help:
- Solution requires all three:
 - Mechanical design
 - Nonlinear Control
 - Machine Learning



Simple walking machines



Flapping-winged flight

