

Designing robots to exploit affordances

Sonia Roberts



KODLAB



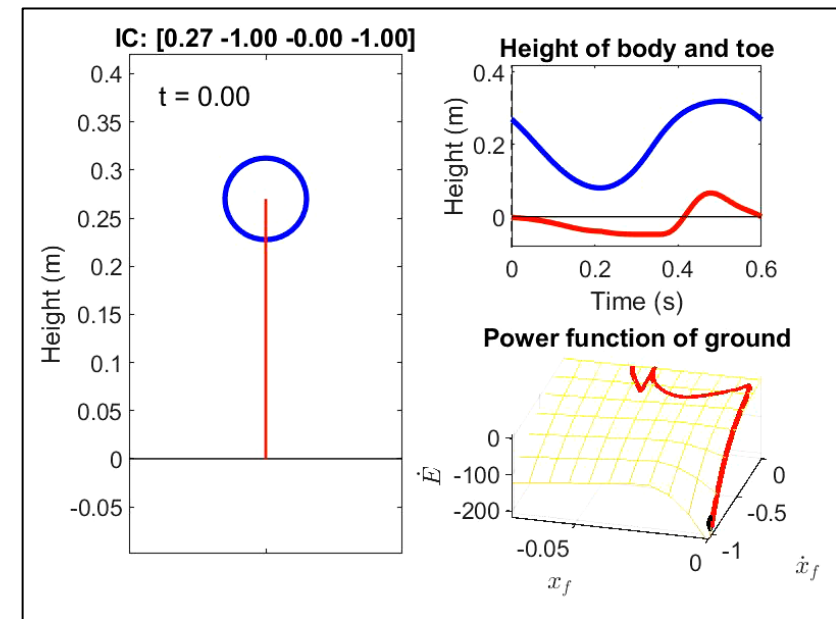
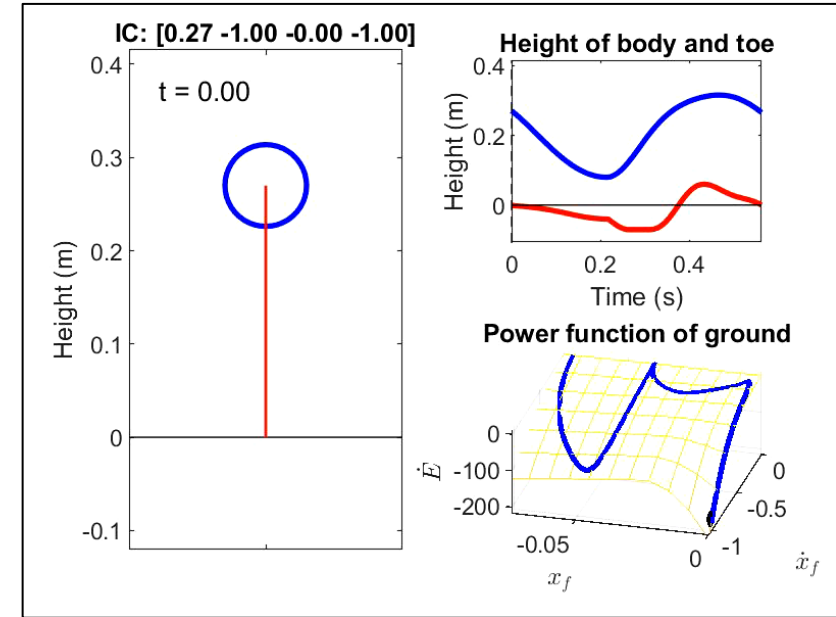
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Designing robots to exploit affordances

- Affordances are perceptually reliable opportunities for purposeful action in a specific agent's environment (Gibson, 1976)
- Relationship between agent and environment: Body shape, sensors, actuators matter
- Robot does not need internal models of affordance for effective exploitation

Examples of Gibsonian Affordances in Legged Robotics Research Using an Empirical, Generative Framework

Sonia F. Roberts^{1*}, Daniel E. Koditschek¹ and Lisa J. Miracchi²



Trade-off between *robustness* and *plasticity*

Robustness:

- Behavior consistent despite changes in environment, sensing, or body shape
- Energy efficient



Plasticity:

- Ability to modify behavior at run time
- Doesn't sacrifice sensing capability



Key question: How do we choose when to design robots with mechanical adaptations versus sensory-driven adaptations?