Designing robots to exploit affordances

Sonia Roberts
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

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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?