



Jonathan Clark

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Research Interests

- Dynamic Legged Robots
 - Climbing
 - Running
- Dynamic Systems
- Bio-Inspired Robotic Design
- Integrated Mechatronic Manufacturing

Research Highlights

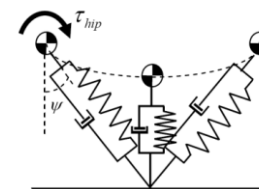
Design and construction of Bio-inspired, dynamic robots fabricated via SDM



Modeling and analysis of simplified dynamic models. Investigating how passive and active structural properties contribute to stability.



Modeling, Analysis, and construction of dynamic climbing robots.



Honors

- Stanford SGF Fellowship recipient
- IC Post-doctoral Fellow
- FSU First-year Faculty Research Award

Professional Activities

- ASME DSCD Robotics TC member
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Multi-modal Legged Locomotion

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- Legged animals can walk, run, leap, climb, swim, dig, and manipulate objects
- Currently robotic systems can do each of these tasks – *Individually*.
- No existing robotic system can perform all of these functions.
- Multi-modal locomotion requires:
 - New Hybrid dynamic models,
 - Better manufacturing techniques
 - Smart passive compliance
 - Better actuation schemes



Eastern Gray Squirrel - wikimedia

What legged robots ought to be capable of doing

Societal Implications

- Improved capabilities in:
 - Search and rescue
 - Surveillance
 - IED, hazmat disposal
 - Transportation
 - Inspection
 - Demining
 - Maintenance

Accomplishments to Date

- Dynamic legged robots that run over rough terrain
- Robots that climb various surfaces
- Robotic grasping and manipulation is well developed

Challenges

- Design problem: specialization vs. flexibility
- Need more robust, integrated structures
- Requires power management and harvesting
- Must have better actuators
- Need new dynamic templates

5/10/20 Year Vision

- FIVE years: Dynamic legged robots that can move in 3+ modes. (Lab)
- TEN years: Integration of novel actuators, control schemes, materials, to enable a system w/ 4+ modes of dynamic locomotion. (Field)
- TWENTY years: Small, energy harvesting, smart autonomous legged devices capable of following a squirrel