Rethinking Multi-Legged Robots:
Passive Terrain Adaptability through Underactuated Mechanisms and Exactly-Constrained Kinematics
NRI Small (IIS-1637647), October 2016 (in NCE)

Aaron M. Dollar

Professor of Mechanical Engineering and Materials Science
and Computer Science

Yale University

Background

- Project Overview
  - Examine passive terrain adaptability in multi-legged robots via underactuated mechanisms
  - Work towards simplified legged robots for very rough terrains
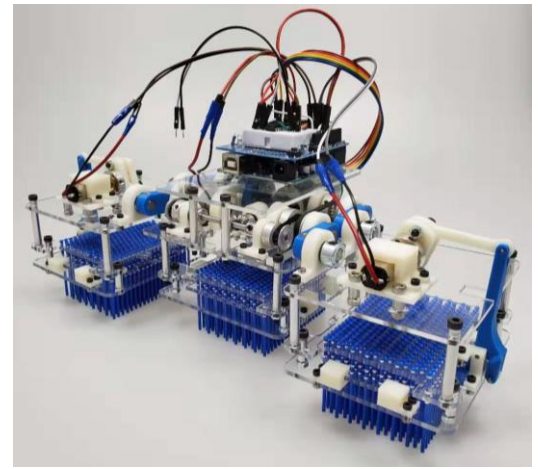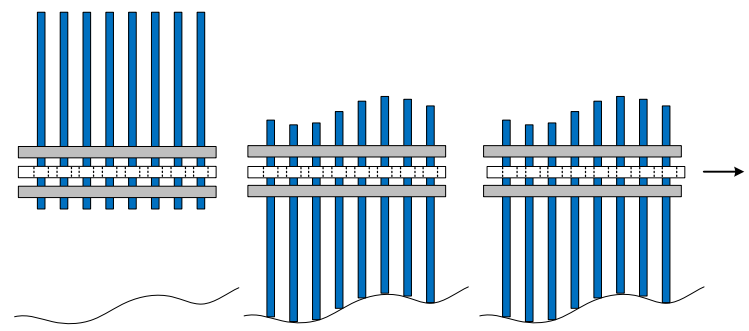
Previous Results

- Initial work showed that prismatic legs were promising

- Previous prototype

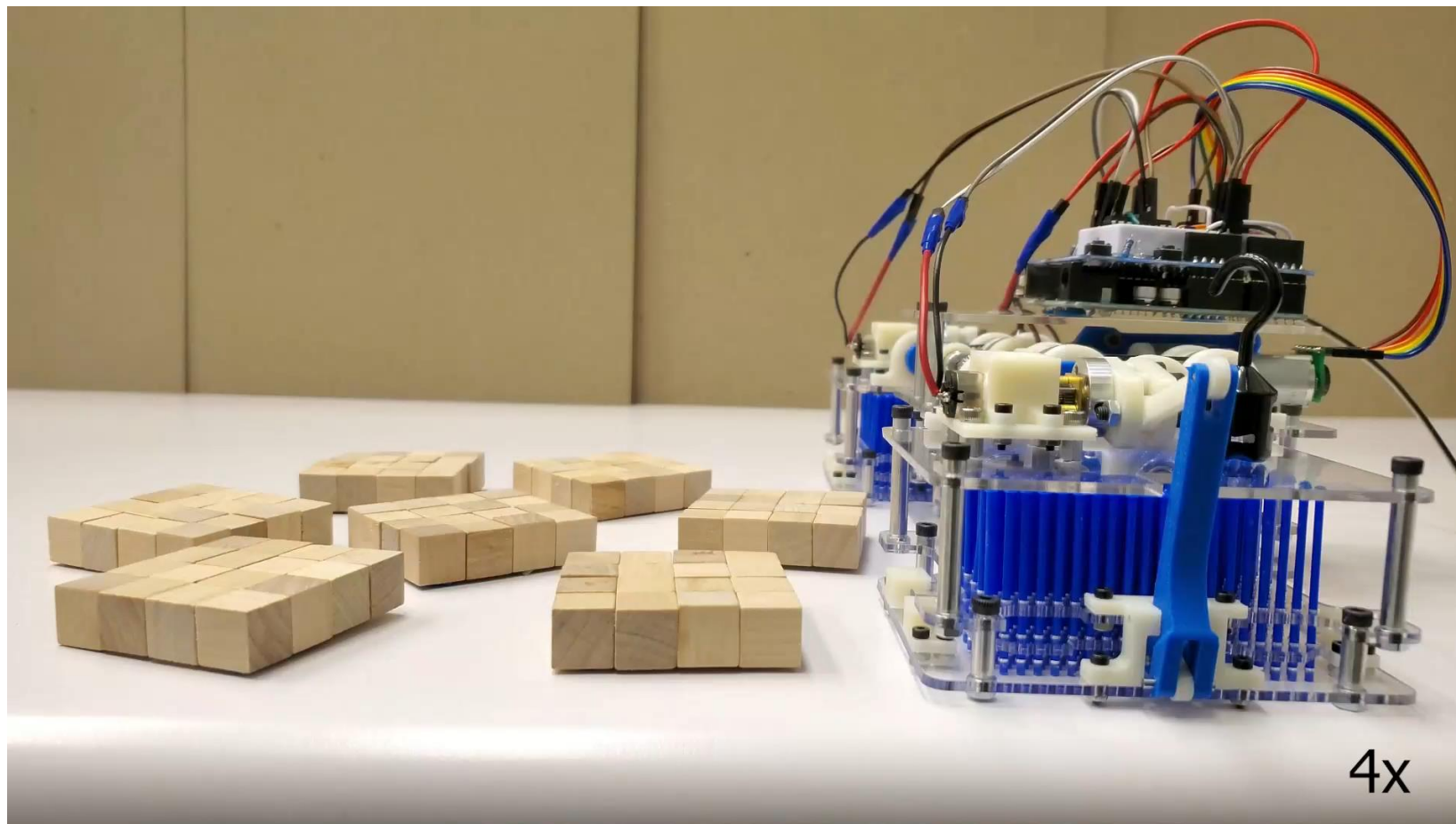 - Some issues with antagonist springs that led to asymmetries and poorer stability
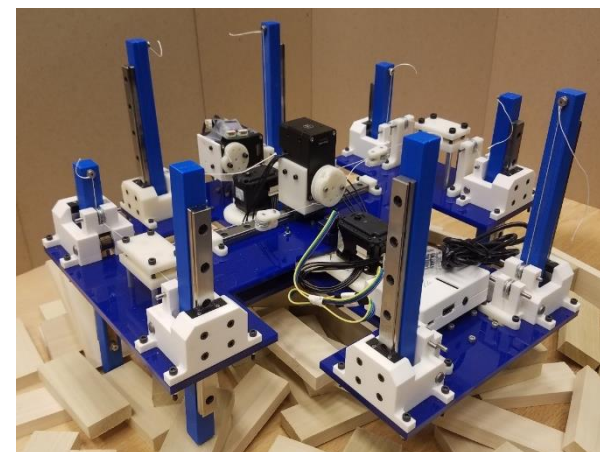
Latest Results

- Consider a "toy problem"
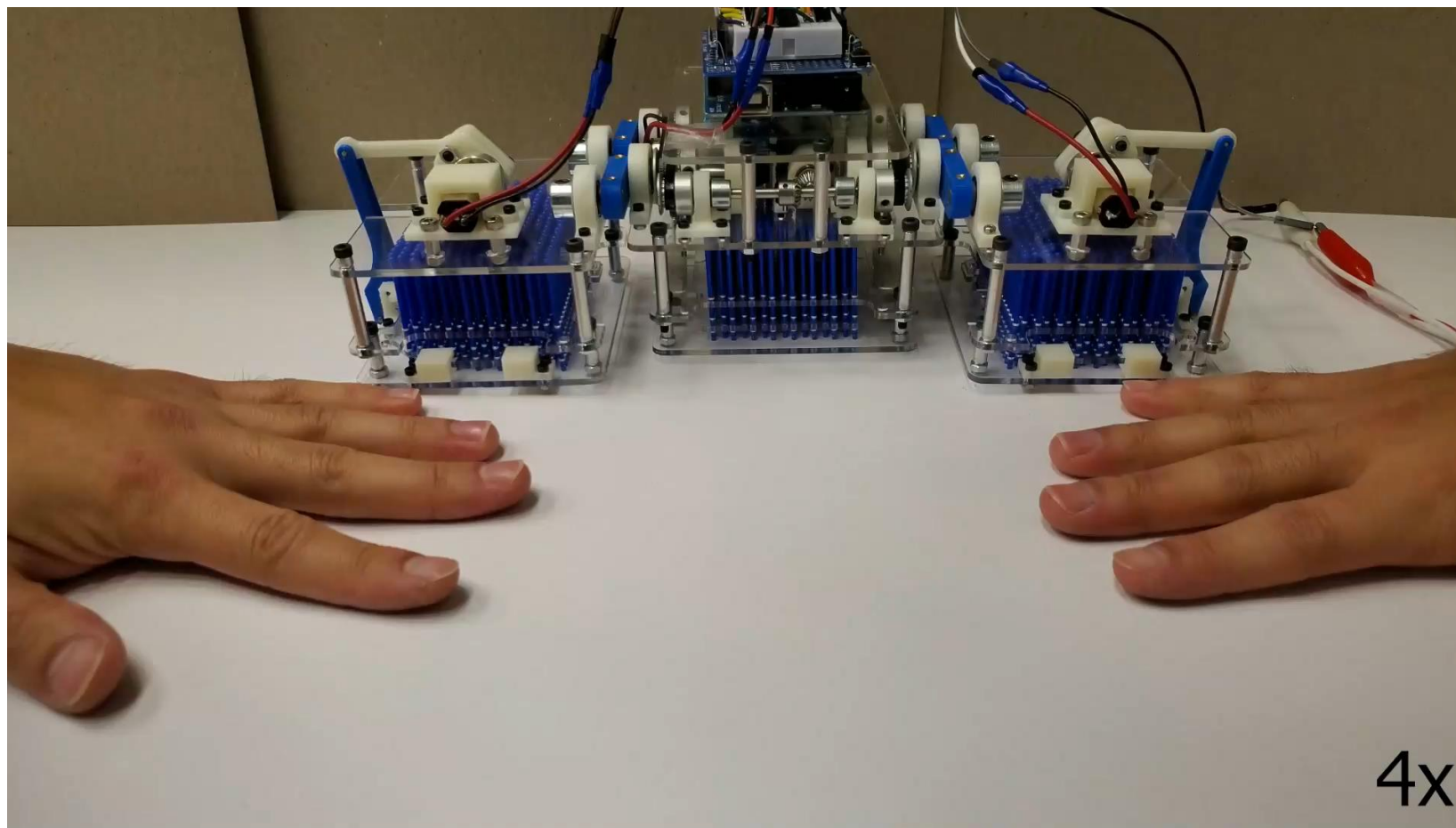 - Pin array toy with additional locking feature

Latest Results

Latest Results

Next Steps

- Examine "drop and lock" leg designs more fully

- Integrate into more practical embodiment
  - Small number of legs
  - More effective locomotion