Mesh of Robots on a Pneumatic Highway (MORPH)
An Untethered, Human-Safe, Shape-Morphing Robotic Platform

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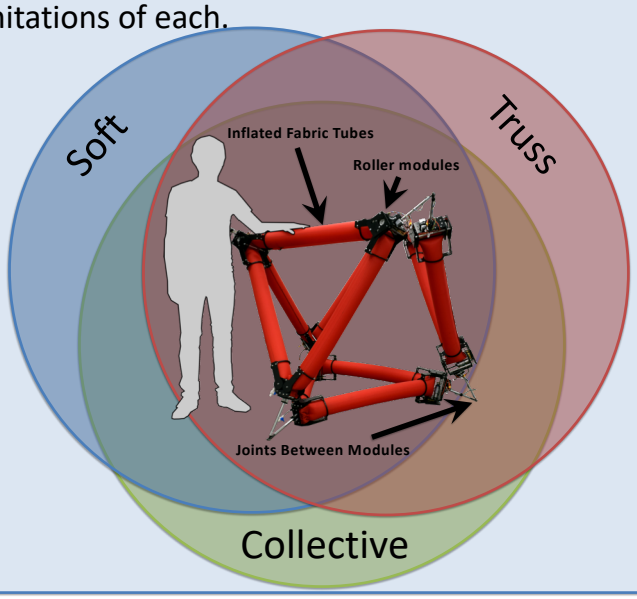
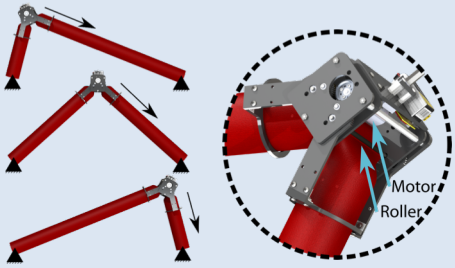
The MORPH concept draws inspiration from soft, collective, and truss-based robots, while overcoming limitations of each.



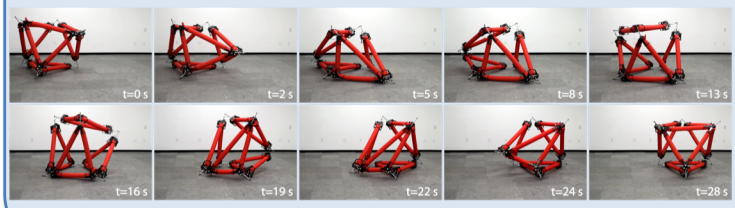
The joints of the robot move relative to the structure



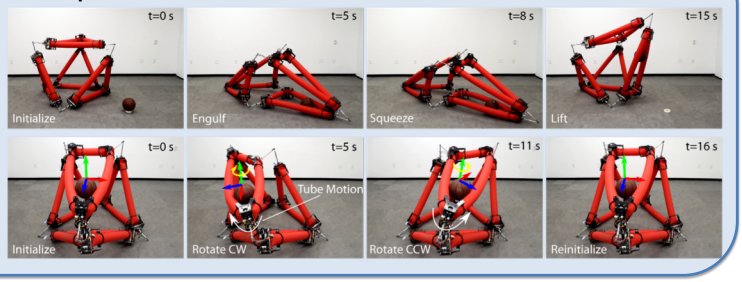
The robot is	So it is	But with our system it also
Soft	Human safe and adaptable	Requires no external air or power (Untethered)
A multirobot collective	Robust to subsystem failure	Has very simple subsystems (1 DOF)
Truss-based	Capable of changing shape, customizable	Lightweight, compliant, and capable of large morphology changes

Results

Locomotion



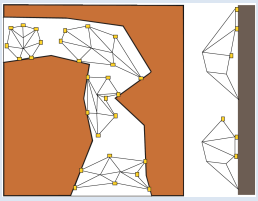
Manipulation



Broader Impacts

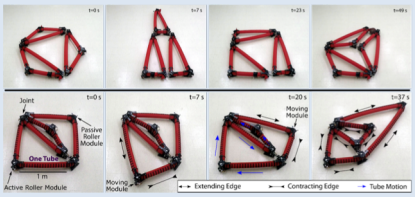
Rough Terrain Locomotion

We will leverage the shape-changing ability to allow the robot to move over rough terrain in search and rescue missions and planetary exploration missions.



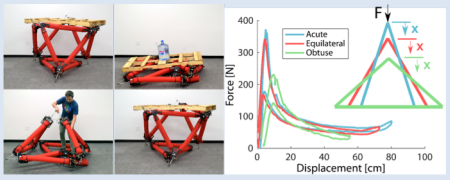
Education

Modularity, reconfigurability and inherent safety give the MORPH system the potential to be a valuable educational tool.



Human-safe interaction

The compliant structure limits the force that can be output. We will use the robot to assist humans in everyday tasks.



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