

Legged and Aerial Robotics for Fire Response



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Complex Terrain



Mini-Problem

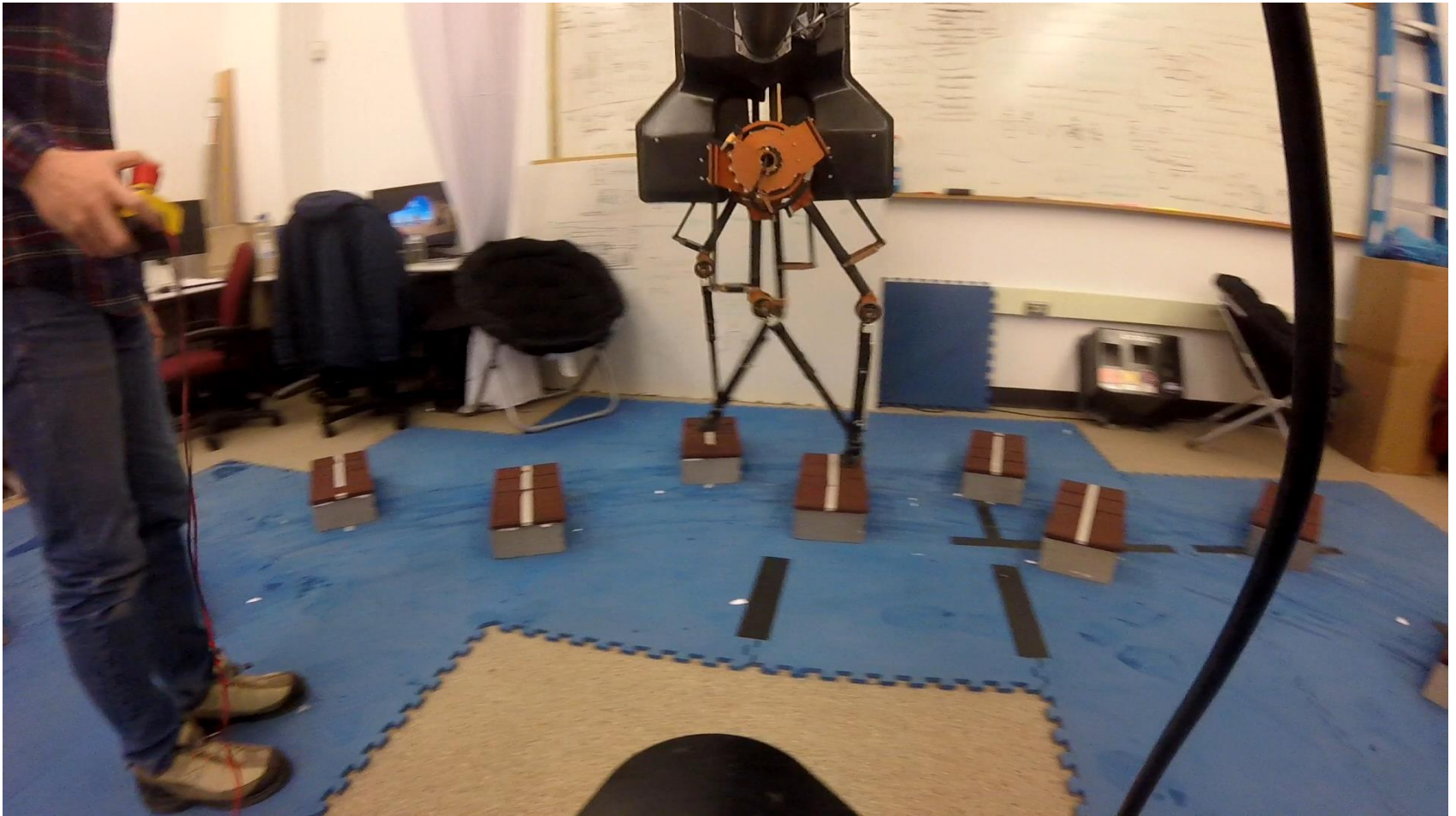


Stepping Stones

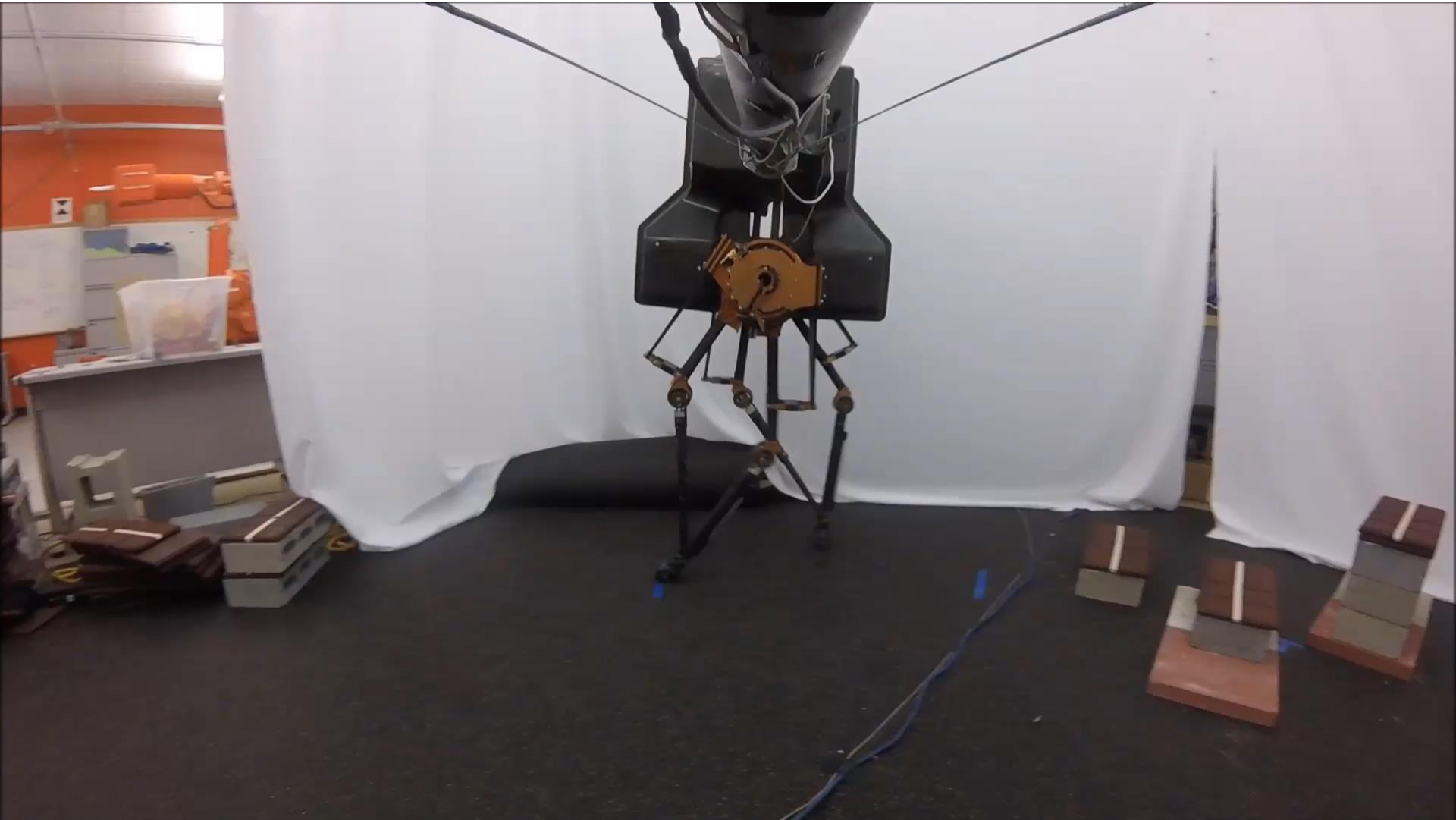
Precise Footstep Placement

Safety-Critical Control

Safety-Critical Control for Legged Locomotion



Safety-Critical Control for Legged Locomotion



Is Perception Useful?



Commercial Air Delivery Projects



Amazon Prime Air



Google Project Wing

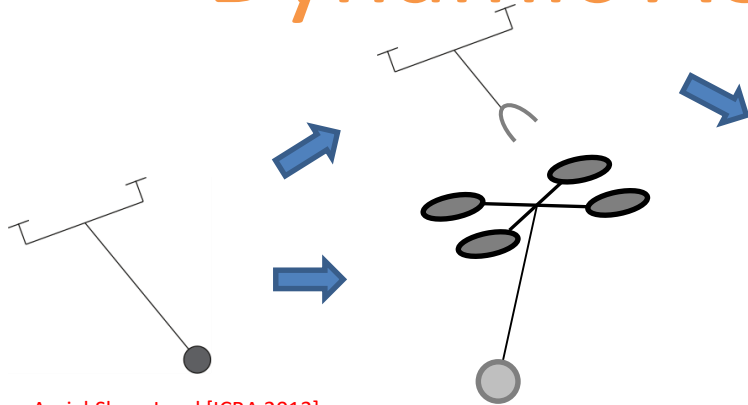


DHL Courier Service



Matternet

Dynamic Aerial Manipulation

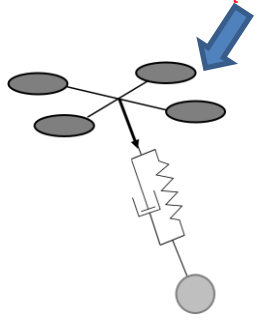


Planar Aerial Slung Load [ICRA 2013]

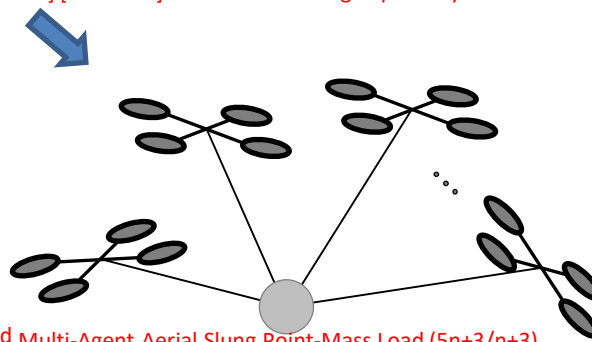
3D Aerial Slung Load (8/4)
[ICRA 2013] [CDC 2013] [RSS 2013]



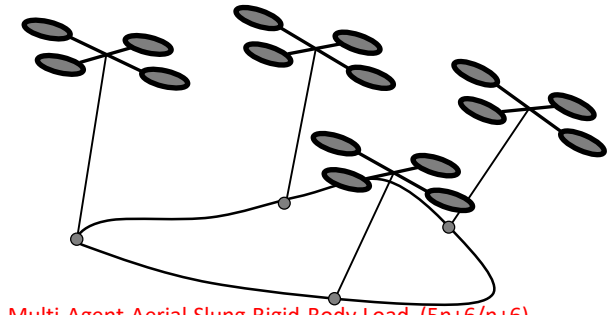
High Speed Dynamic Aerial Pickup and Object Retrieval [IDETC 2013] [ICRA 2014] [BB 2014]



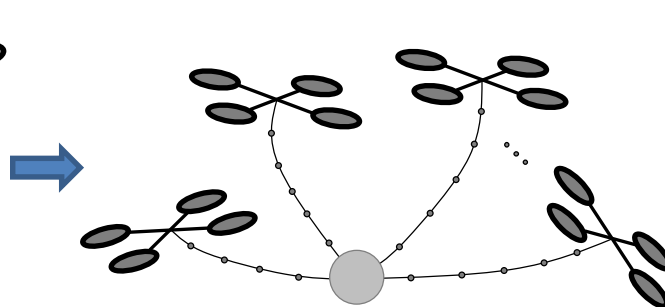
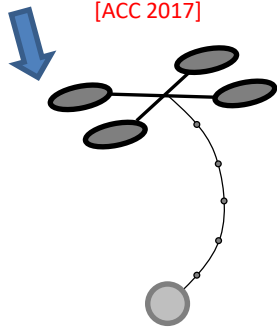
Quadrotor + Elastic Cable suspended Payload
[ACC 2017]



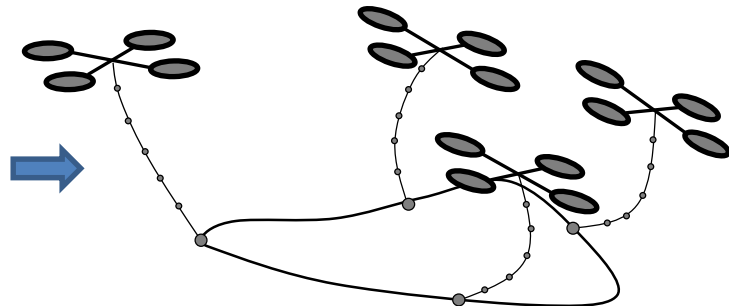
Multi-Agent Aerial Slung Point-Mass Load ($5n+3/n+3$)
[RSS 2013, CDC 2013] [DSCC 2016]



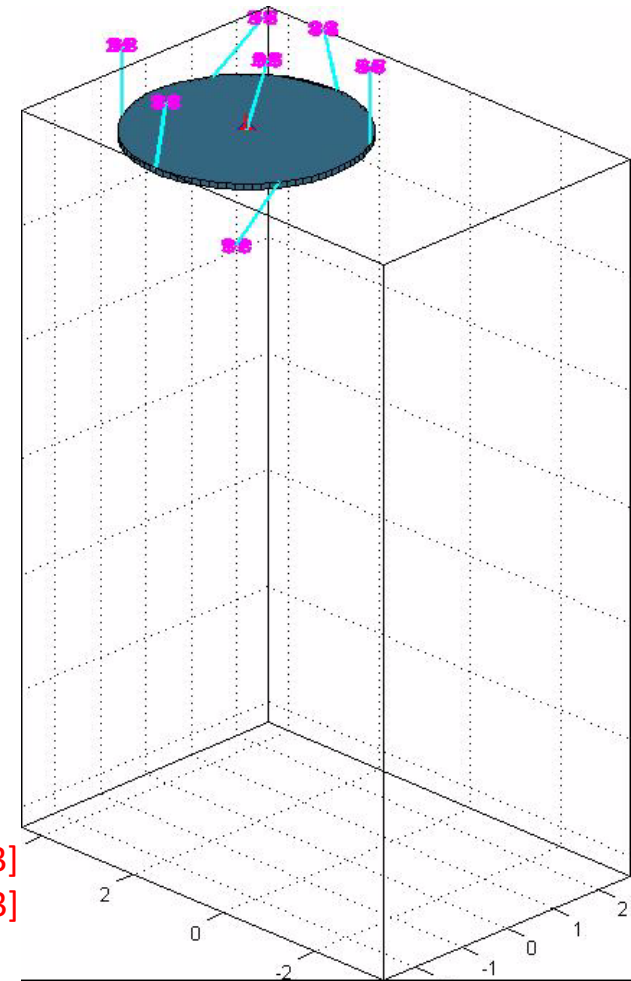
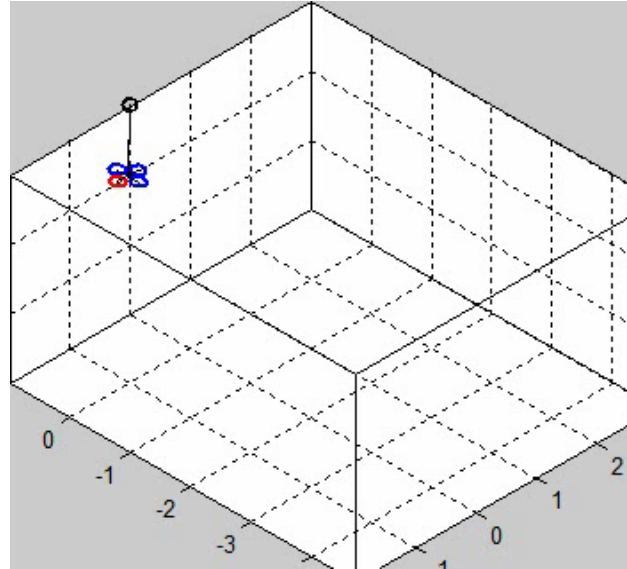
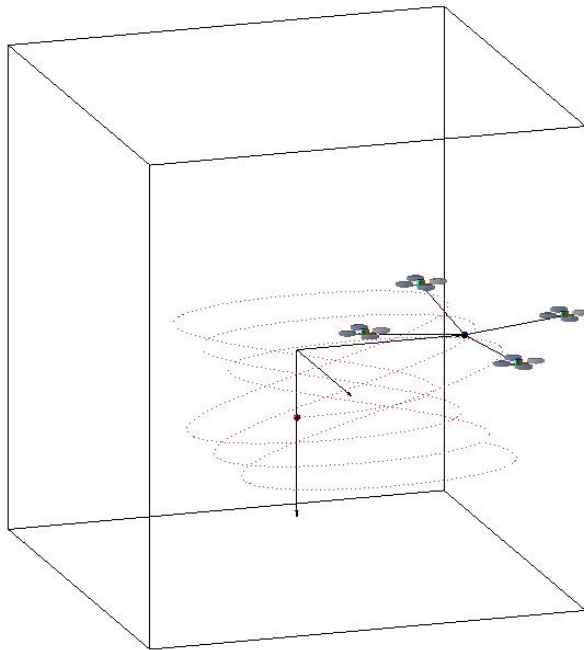
Multi-Agent Aerial Slung Rigid-Body Load ($5n+6/n+6$)
[RSS 2013, CDC 2014]



Dynamic Planning and Control for Aerial Manipulation with a Flexible Cable [ICC 2018]



Geometric Control



[K. Sreenath, T. Lee, V. Kumar, CDC 2013]

[T. Lee, K. Sreenath, V. Kumar, CDC 2013]

[G. Wu, K. Sreenath, CDC 2014]

Fire Blankets – For Houses!

