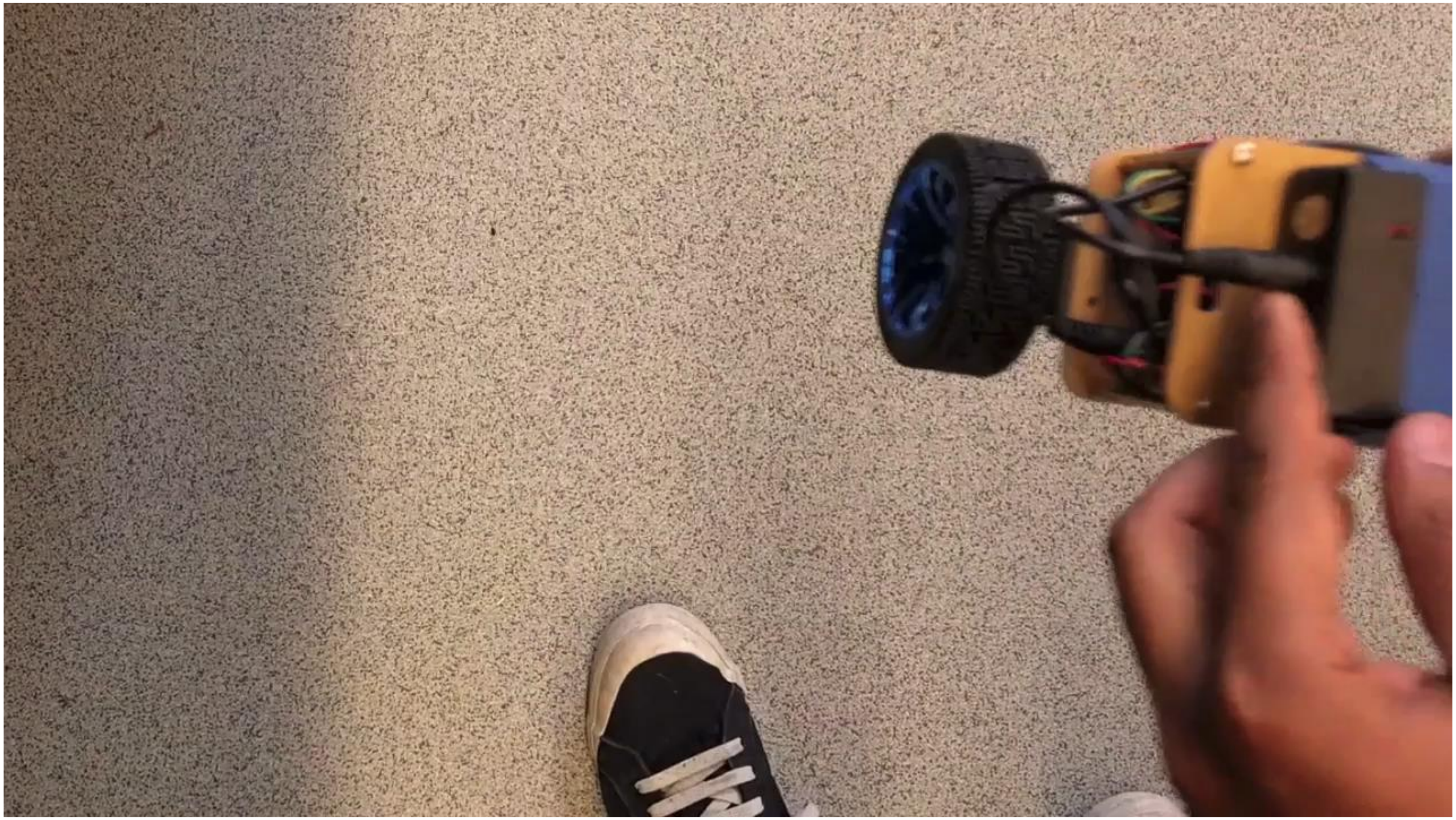
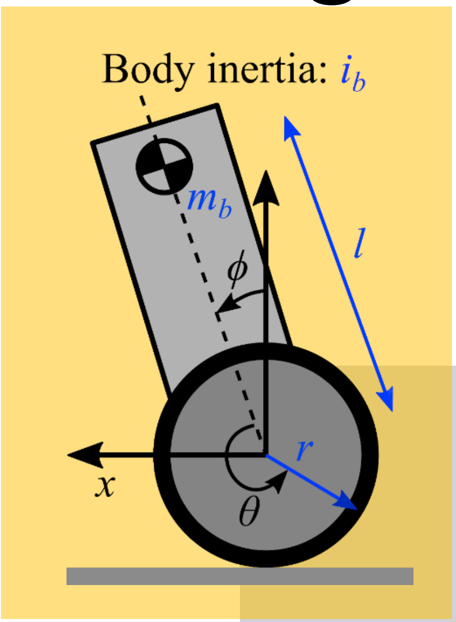
Intro: Control and Planning for a Mobile Inverted Pendulum (MIP)

MIP track, week 1

Mobile Inverted Pendulum (MIP)



Progression of Applications



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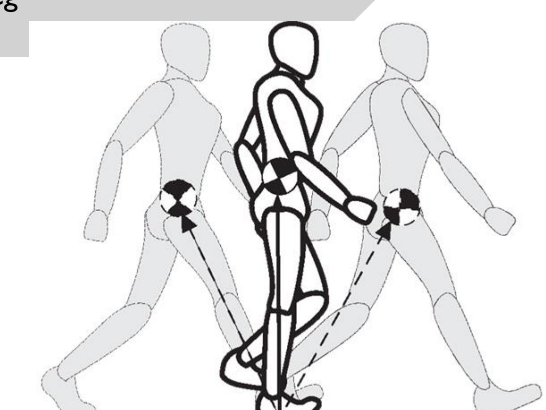

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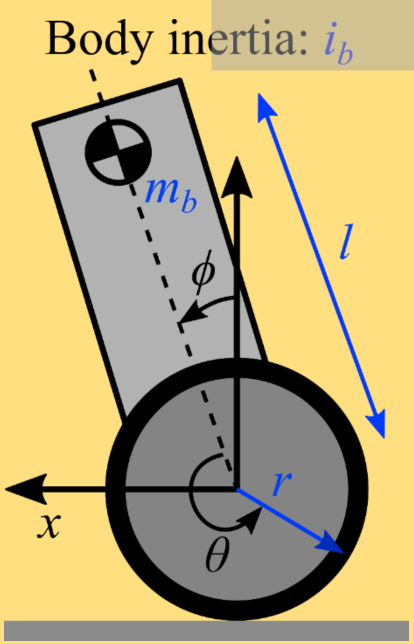
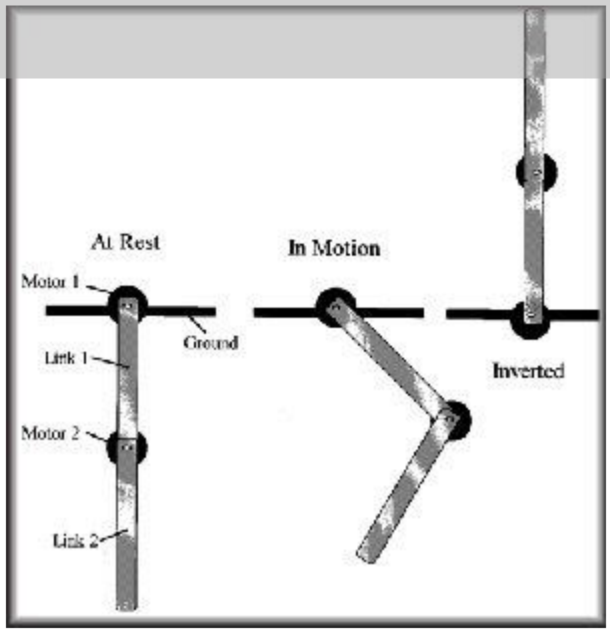
Progression of Learning

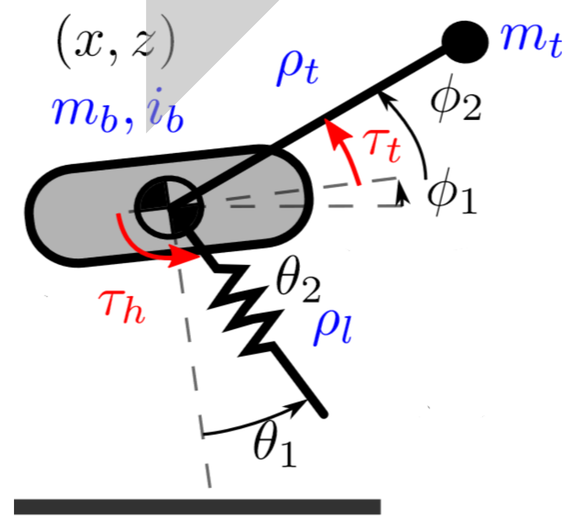


Inverted pendulum



http://www.cc.gatech.edu/projects/acrobot/stag
e1.html

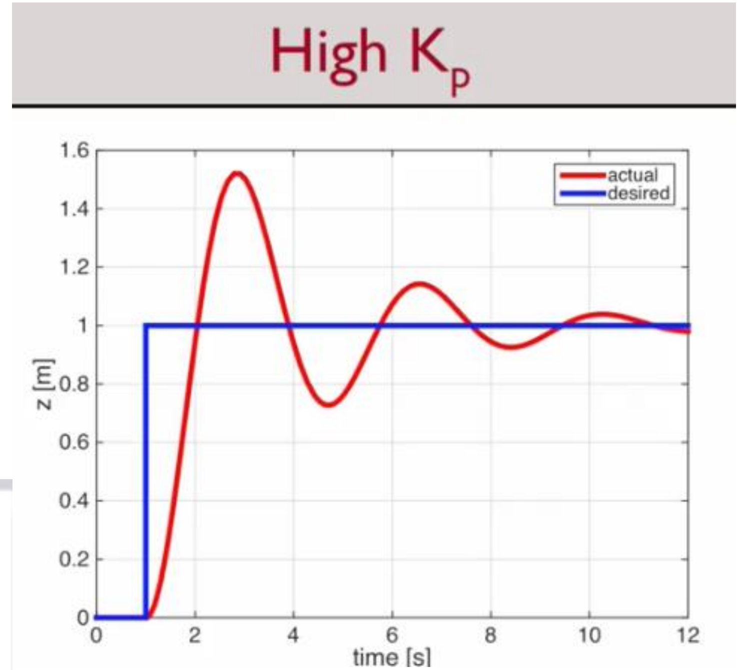
Double pendulum

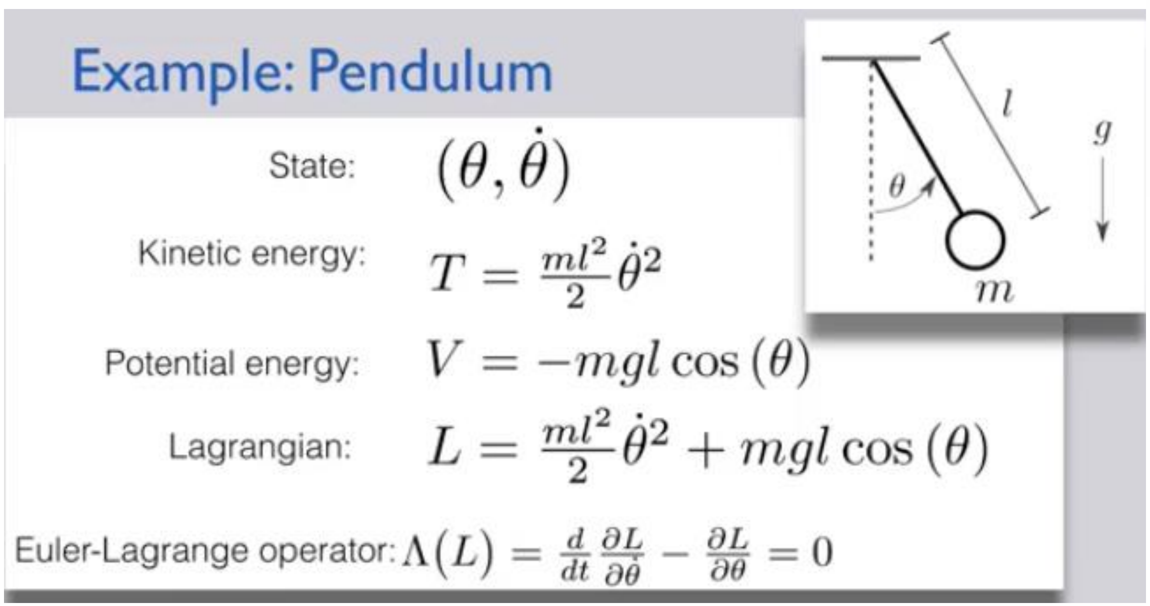


Legged locomotion

Modeling and Control

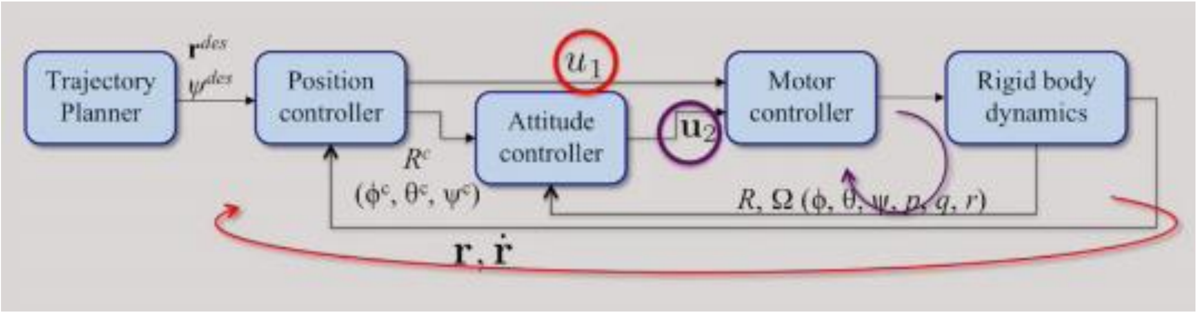
- Aerial Robotics
- Mobility



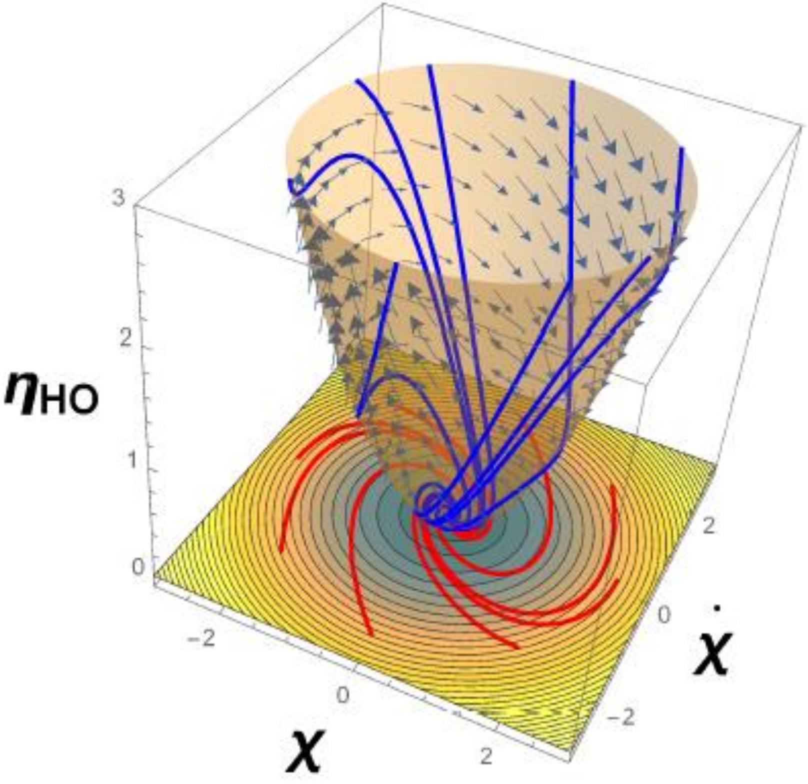


Feedback Motion Planning

- Aerial Robotics

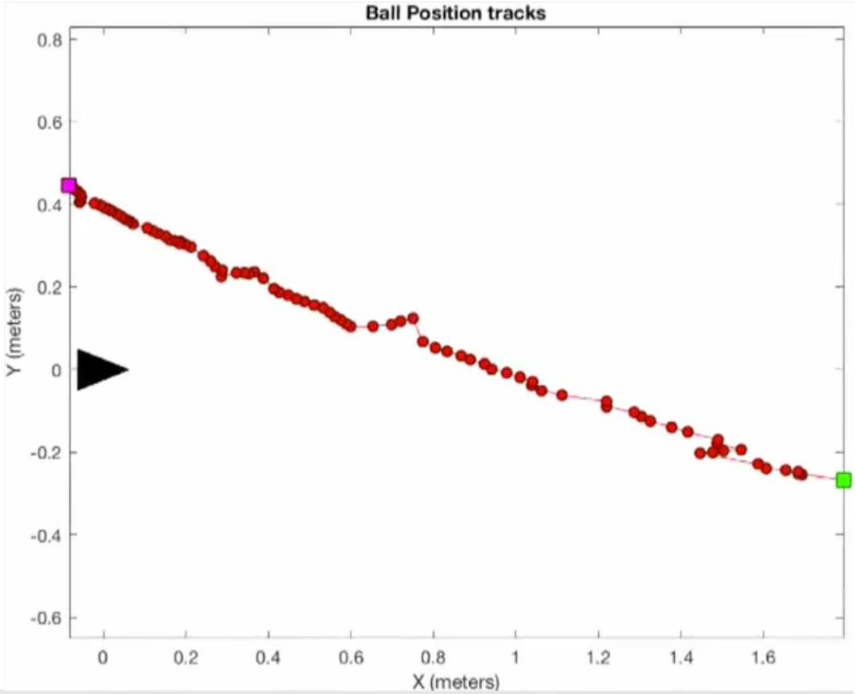


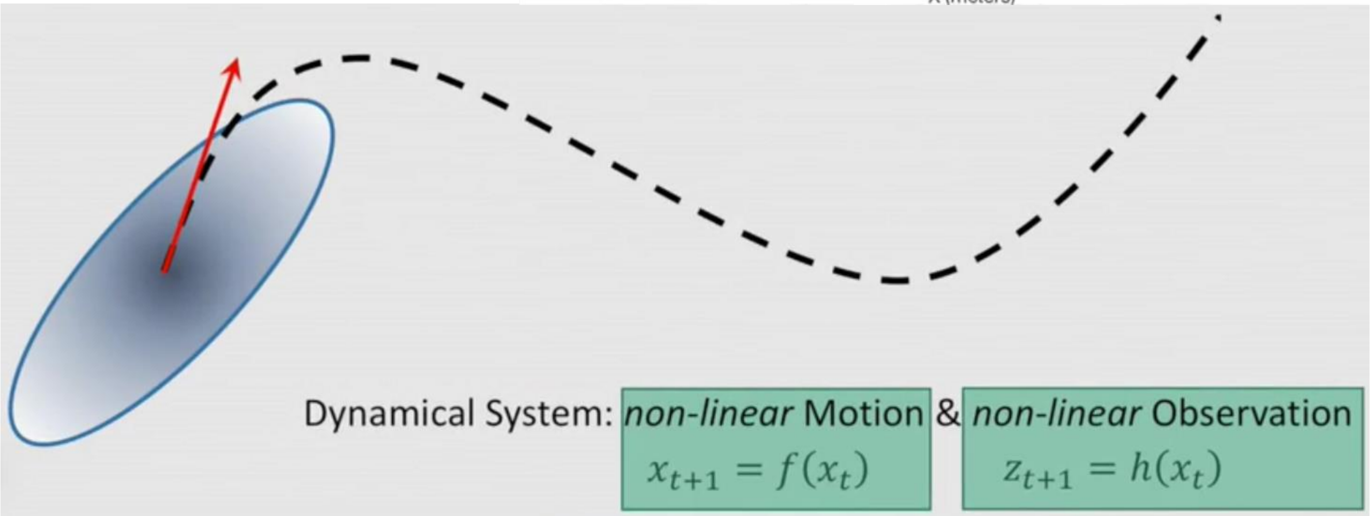
- Mobility



Sensory Processing and State Estimation

- Estimation





What to Expect & Deliverables

- Review specialization lectures
- One new application-focused lecture per week
- 1-2 programming assignments per week
  - Week 1: Integrating an ODE with MATLAB
  - Week 2: PD tracking
  - Week 3: EKF for scalar attitude estimation
  - Week 4: Dynamical simulation of a MIP
  - Week 5: Balancing control
  - Week 6: Noise-robust control and planning
- MATLAB simulation environment