Optimal Control and Reinforcement Learning

16-745

Spring 2022

Course Team

Zac Manchester
Instructor

Brian Jackson
TA

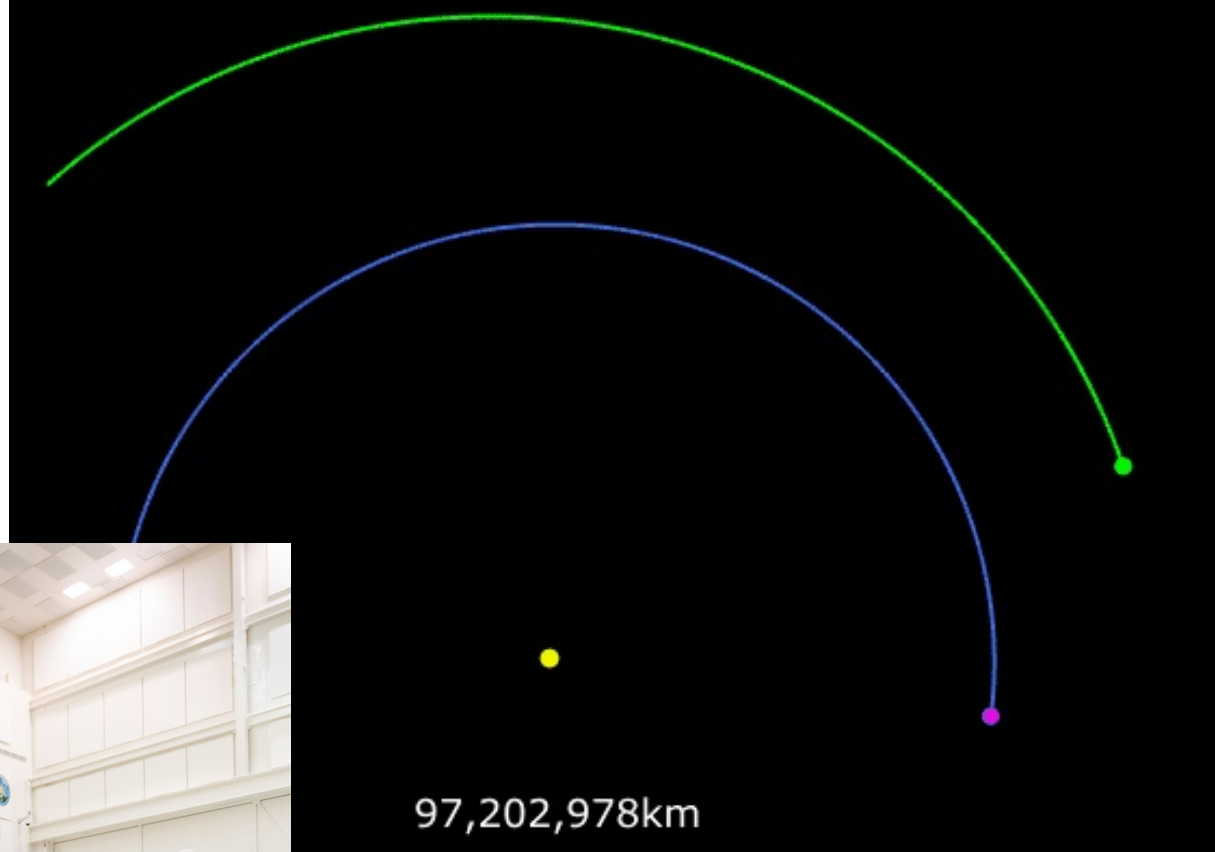Kevin Tracy
TA

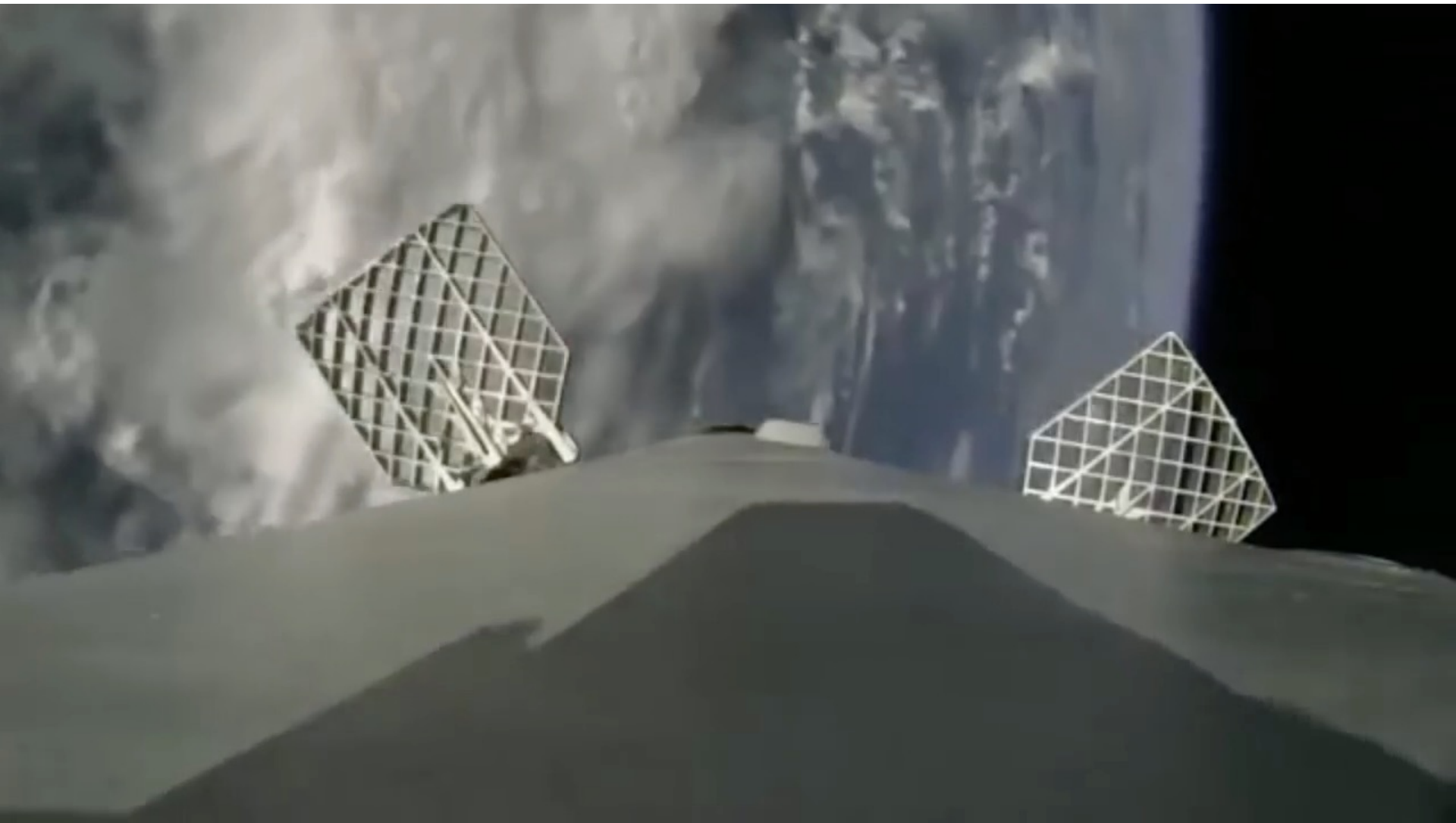Chiheb Boussema
TA

Alexander Bouman
TA

What Is Optimal Control For?

What Is Optimal Control For?

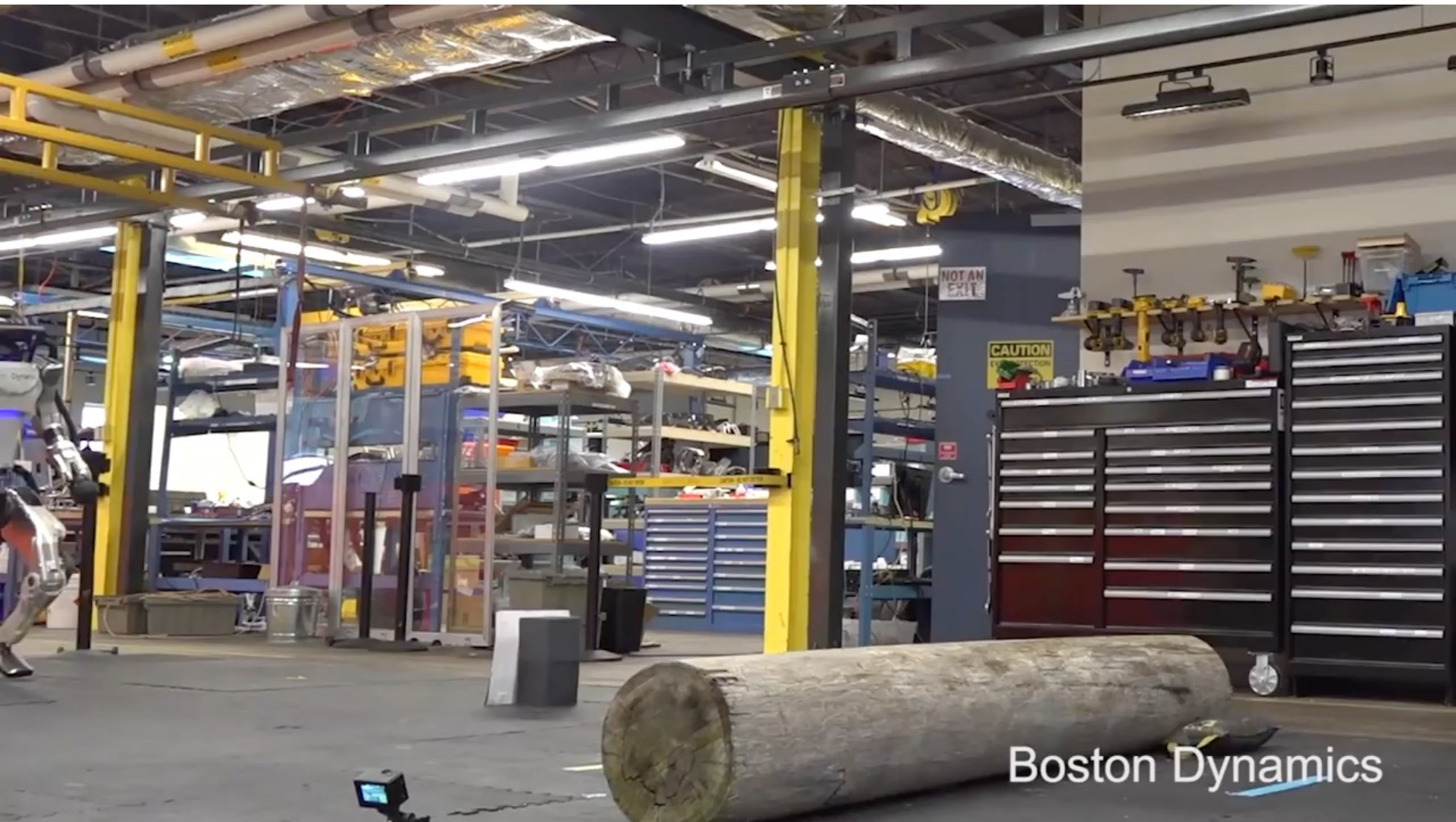# What Is Optimal Control For?

What Is Optimal Control For?

MIT Mini Cheetah
MIT Biomimetic Robotics Laboratory

What Is Optimal Control For?

Boston Dynamics

Current Research Challenges

- Dealing with contact (legged locomotion, manipulation, etc.)

- Bridging the gap between model-based control and RL

- Making RL more data efficient by incorporating prior knowledge

- Safety guarantees for uncertain nonlinear systems

- Dealing with other (possibly adversarial) agents

What Are We Doing Here?

- Optimization-based control techniques

- Focus on robotics applications over theory

- Homeworks (~4) focused on algorithm implementation

- Course project in groups of 1-5 (do something cool!)

Logistics

- Lectures on Zoom – will be recorded and posted

- Notes from lectures will be posted

- Piazza for course communication

- Homework will be distributed/collected through GitHub

- Office hours TBD

Assignment Zero:

Fill out course survey:

https://forms.gle/R1KqBKzDSBB3EBvW6

Join course Piazza:

https://piazza.com/class/kyd8kjj6yac6m1