



W5: Interplay between Control, Optimization, and Machine Learning

Organizers:



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Control \leftrightarrow Optimization \leftrightarrow Machine Learning

Controls:

- first-principle dynamical models
- focused on safety/robustness

- dynamical systems & feedback
- semidefinite programming

Increasingly data-driven; data is cheap, plentiful, and complex

Machine Learning:

- generic parametrized models
- focused on speed/scalability

- statistics & learning theory
- first-order methods

Sequential decision-making in safety-critical environments



Topics

First-order optimization algorithms

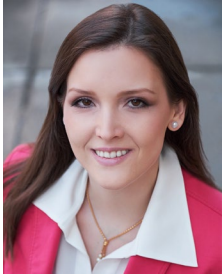
- continuous-time perspective
- dynamical systems / Lagrangian viewpoint
- robust control viewpoint

Control \rightarrow ML

Data-driven control

- sample complexity bounds
- policy gradient

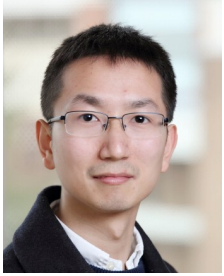
ML \rightarrow Control



9:10 – Jelena Diakonikolas

9:50 – René Vidal

10:30 – 10:40 – Coffee break



10:40 – Quanquan Gu

11:20 – Bin Hu

12:00 – 1:40 – Lunch break



1:40 – Laurent Lessard

2:20 – Na Li

3:00 – 3:20 – Coffee break



3:20 – Sarah Dean

4:00 – Hoang M. Le