

TECHNICAL COMMITTEE FOR

## MODEL-BASED OPTIMIZATION FOR ROBOTICS



<https://www.tcoptrob.org/>

# 2025-2026 TC Seminar Series

**Time:** February 19th, 2026, 11AM EST

**Zoom:** <https://dartmouth.zoom.us/j/94765993258?pwd=aErnkjFBqQaOTEgonxZkeNTbojHRbp.1>



**Dr. Thomas Lew**

**Toyota Research Institute**

*Uncertainty-Aware Control at the Limits*

**Abstract:** Expert drivers can reliably pilot vehicles at their performance limits, lap after lap, and despite changes in vehicle behavior due to tire temperature, wear, and weather conditions. Current planning and control algorithms still struggle in such settings. In this talk, I will present recent advances in uncertainty-aware control taking us one step closer to expert assistive driving systems: Bayesian information gathering methods for efficient data collection and adaptation, new tools for uncertainty-aware model predictive control (MPC), and a scalable GPU-accelerated differentiable MPC solver suitable for reinforcement learning. I will present drifting and racing results on high-performance cars, and discuss next steps toward scalable, differentiable, data-driven, and uncertainty-aware methods for reliably controlling systems at their limits.

**Biography:** Thomas Lew is a Research Scientist at the Toyota Research Institute. He completed his PhD at Stanford University, his MSc at ETH Zurich, his BSc degree at EPFL, and research internships at Google Brain Robotics and at the NASA Jet Propulsion Laboratory. His research focuses on the design of decision-making algorithms for autonomous systems using techniques in optimization, control, and machine learning. Thomas is a recipient of the Outstanding Paper Award at the 2024 Conference on Robot Learning, the Outstanding Student Paper Award at the 2023 IEEE Conference on Decision and Control, and the 2023 IEEE Control Systems Magazine Outstanding Paper Award.