Zhiyu Zhang

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Research interest

Theoretical aspects of machine learning and optimization. Specifically, I work on adaptive online learning, i.e., designing sequential decision making algorithms that optimally exploit problem structures.

Education

Boston University
PhD, System Engineering — *2018 – 2023 (Expected)*

Tsinghua University
BEng, Mechanical Engineering — *2014 – 2018*

Delft University of Technology
Undergraduate exchange student — *Fall 2016*

Publication

Optimal Parameter-free Online Learning with Switching Cost
***Zhiyu Zhang**, Ashok Cutkosky, Ioannis Paschalidis* — *NeurIPS 2022*

- Also presented at ICML 2022 Workshop "Complex Feedback in Online Learning".
- Improves the regret bound from our AISTATS 2022 paper to the optimal Pareto-optimal rate.
- Shows that the continuous-time framework from our ICML 2022 paper can reveal generalizable knowledge across different online learning settings.

PDE-Based Optimal Strategy for Unconstrained Online Learning
***Zhiyu Zhang**, Ashok Cutkosky, Ioannis Paschalidis* — *ICML 2022*

- An unconstrained online learning algorithm with the optimal loss-regret tradeoff and leading constant optimality.
- Designed through a continuous-time framework, which requires less guessing than existing approaches.

Adversarial Tracking Control via Strongly Adaptive Online Learning with Memory
***Zhiyu Zhang**, Ashok Cutkosky, Ioannis Paschalidis* — *AISTATS 2022*

- A new linear system controller that can provably track an adversarially generated target sequence.
- The key component is the first comparator adaptive online learning algorithm with switching costs.

Provable Hierarchical Imitation Learning via EM
***Zhiyu Zhang**, Ioannis Paschalidis* — *AISTATS 2021*

- Also presented at ICML 2020 Workshop "Theoretical Foundations of Reinforcement Learning".
- Under certain conditions, the Expectation-Maximization algorithm for Hierarchical Imitation Learning converges to a norm ball around the true model parameter.

Award

Outstanding reviewer (10%) of ICML 2022

Top reviewer (10%) of AISTATS 2022

Dean's Fellowship
College of Engineering, Boston University — *2018 – 2019*

Scholarship for Distinction in Academics
Tsinghua University — *2014 – 2017*

Scholarship for Outstanding Exchange Students
China Scholarship Council — *2016*

Service

Conference reviewer: AISTATS 2021-2023, ICML 2022, NeurIPS 2022.

Subreviewer: NeurIPS 2020, L4DC 2020.

Journal reviewer: IEEE Transactions on Robotics (1 time)

Teaching and mentoring

Teaching Assistant

Boston University *2020 – 2021*

- EK 381: Probability, Statistics, and Data Science for Engineers
- ME 366: Probability and Statistics for Mechanical Engineers
- ME 404: Dynamics and Control of Mechanical Systems

BU RISE program mentor

Boston University *Summer 2019*

- Summer research program for high school students.