Yinbin Han

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EDUCATION

University of Southern California Sep 2021 – Present
Ph.D. Student in Industrial and Systems Engineering

Chinese University of Hong Kong, Shenzhen Sep 2017 – Jun 2021
B.S. in Mathematics

University of California, Berkeley Jan 2020 – May 2020
Exchange Student

RESEARCH INTERESTS

- Applied Probability, Stochastic Modeling and Stochastic Control
- Stochastic Optimization
- Reinforcement Learning
- Financial Engineering

PROJECTS

Aircraft Switching Sep 2020 – Present

- Studied an aircraft switching problem: given two stochastic processes and two servers as well as the current observation of arrival, decide whether to switch two servers to accommodate unexpected demand
- Provided the monotonicity of value function with respect to the parameters including time, arrival rate, and server capacity
- Proved the optimality condition and optimal threshold based policy and designed the corresponding algorithm
- Established the upper and lower bound of the supplementary value with the switching flexibility

Deep Optimal Stopping May 2020 – Sep 2020

- Adapted a deep neural network to approximate the value function in a discrete-time optimal stopping problem and applied the method to Bermudan option pricing
- Compared the simulated results to a theoretical outcome from the Black-Scholes Model for European option pricing to verify the correctness
- Replicated a published paper's simulation; analyzed the convergence and the performance of the neural network; found the previous work's limitations: too strong assumption and huge sample complexity
- Created a mathematical model using dynamic programming principle for the optimal stock selling/buying decision in the bull/bear switching market and found each single decision through deep optimal stopping

Reinforcement Learning Based Ride Sharing Feb 2019 – Aug 2019

- Adapted deep reinforcement learning to find the optimal consecutive batch-matching time interval for online ride hailing platforms
- Replicated the results of a paper published by Didi Chuxing; verified the correctness and analyzed the performance of previous methods
- Created a traffic network using Python and generated passenger-driver data through a mixed Gaussian model. Organized the simulation to verify the feasibility of our method

TEACHING EXPERIENCE

- **Undergraduate Student Teaching Fellow** at CUHKSZ: provide weekly tutorial sessions, office hours
  - Ordinary Differential Equations — Spring 2021
  - General Biology — Summer 2019

AWARDS & HONORS

- National Scholarship of China — 2020
- Academic Performance Scholarship, CUHKSZ — 2018, 2019, 2020
- Dean's List, CUHKSZ — 2018, 2019, 2020

TECHNICAL SKILLS

- **Programming Languages:**
  - Proficient at Python, Numpy, Pandas, R and MATLAB
  - Familiar with Java, C/C++, MySQL
  - Experience with Hadoop, Spark and CUDA