Haoran Su

haoransu.cal@gmail.com | anthonysu.github.io| linkedin.com/in/hs2022/
250 Bryant Street, Mountain View, CA 94041 | +1(510)316-2541

EDUCATION

New York University — New York, NY
Ph.D. in Engineering — 06/2022
Selected Courses: Machine Learning, Deep Learning, Data Mining, Stochastic Modeling

University of California, Berkeley — Berkeley, CA
M.Sc. in System Engineering — 05/2018
Selected Courses: Artificial Intelligence, Dynamic Programming, Statistical Modeling

University of California, Berkeley — Berkeley, CA
B.A. Computer Science && B.Sc. in Engineering — 05/2017
Selected Courses: Data Structure, Algorithms, Computer Architecture, Software Engineering, Database

TECHNICAL SKILLS

Programming Languages	Python, PyTorch, TensorFlow, Java, C/C++, Ruby-on-rail, Matlab, R
Libraries & Toolbox	Pandas, NumPy, SciKit-learn, TensorBoard, Matplotlib, Seaborn, Gym
Platforms & Tools	Git, Docker, Bash, Kafka, Redis, Abase2, Jupyter, PySpark, Grafana, Linux

PROFESSIONAL EXPERIENCE

TikTok, Search — Mountain View, CA
Machine Learning Engineer — *08/2022 - present*

- Developing online/offline pipeline for video comment section recommendation products with **C++** and **python**.
- Utilizing **TensorFlow** to enhancing roughsort and finesort model to improve 30% strict/loose CTR.
- Conducting **AABB tests** for features iterations based on millions of US and non-US users.
- Monitoring impressions, clicks and other metrics via **Grafana**. Familiar with alarms troubleshooting procedure.
- Developing **Python** and **Java** scripts for day-to-day maintenance and strategy inspirations.
- Leveraging **Kafka**, **Abase2**, **HDFS** and **Hive** in the **Linux** environment for the end-to-end development workflow.
- Collaborating **cross-functionally** with products, operations and QA to deliver TikTok recommendation products.

Siemens, Physics-aware AI — Princeton, New Jersey
Machine Learning Research Intern — *05/2021 - 08/2021*

- Mined clients' needs with Siemens mobility and proposed feasible research plan with time constraints.
- Designed and implemented a multi-agent deep reinforcement learning with **PyTorch** to incorporate traditional time-variant shortest path finding scheme for emergency vehicles.
- Validated the proposed methodology on traffic simulator **SUMO** and **AIMSUM** and outperformed state-of-the-art benchmarks by an average of 30%.
- Published research outcomes in various AI venues including NeurIPS, AAAI and Transportation Research.

ACADEMIC EXPERIENCE

C2SMART Center, New York University — New York, NY
Research and Teaching Assistant — *01/2020 - present*

- Leading the project of deep reinforcement learning-based connected vehicles coordination for emergency services in mixed-connectivity urban settings. Conducted experiments on simulation software as well as in-field tests.
- Instructed selected classes in graduate-level courses of Stochastic Modeling and Operation Research. Taught fundamentals in dynamic programming and linear programming.
- Drafted and graded homework assignments, coursework materials and exams. Held weekly office hours to help students solve questions in homework.

ACADEMIC PROJECTS

E-scooters Modal Demand Estimation in NYC with CitiBike

- Established a multivariate log-log linear regression model to estimate ridership demand based on socio-demographically factors such as ratio of age groups, number of scooters provided and population on a multi-TAZ zone basis. Validated the proposed model based on MAE and coefficient of variation.
- Proposed a nonlinear multi-factor model to break down components of e-scooter demands are replacing other modes or replacing access/egress trip for transit. Result demonstrated distance as the pivot factor to separate two motivates for traveling via e-scooters. Evaluated coefficients of estimation via bootstrap method.
- Performed revenue analysis for Manhattan daily travel and compared with revenue management with CitiBike. The proposed model projects an annual revenue of $77M for a fleet of 2000 e-scooters deployed in Manhattan.

Uber-Transit Booking Service Analysis with Uber

- Data mining and wrangling based on designed data schema with users and trip information. Formulated model scope and identified labeled users on 2 million trip information. Applied **PCA** and **LDA** to reduce dimensionality.
- Applied assorted classification algorithms including **Logistic Regression**, **Random Forest**, **XGBoost** and **KNN**, via built-in and self-developed python packages and increase the accuracy of target service usage by 20%.
- Established a **LSTM-based** deep neural network model to predict user's multimodal traveling demand in proposed time-frame. Experimented on target population and increased booking by 30% through revenue management.

Reinforcement Learning on Connected Vehicle Coordination with Mixed-autonomy (Ph.D. Thesis)

- Customized **OpenAI Gym** to model urban roadway from microscopic motion planning perspective to macroscopic traffic management perspective. Bridged **PyTorch**-RL frameworks with simulation software.
- Reproduced state-of-the-art value-based learning algorithms with prioritized experience replay and fixed targets through dueling/double **DQN** to dispatch real time coordination strategies for vehicles.
- Extended the model into Dec-POMDP settings against non-stationarity. Designed the **multi-agent actor-critic** methods for vehicle coordination. Saved 30% time for emergency vehicle passage than the benchmark system.

SELECTED PUBLICATIONS

H. Su, K. Shi, J. Y. J. Chow, and L. Jin, "Dynamic queue-jump lane for emergency vehicles under partially connected settings: A multi-agent deep reinforcement learning approach," arXiv.org, 15-Jan-2021. [Online]. Available: https://arxiv.org/abs/2003.01025. [Accessed: 23-Oct-2022].

H. Su, Y. D. Zhong, B. Dey, and A. Chakraborty, "EMVLight: A Decentralized Reinforcement Learning Framework for Efficient Passage of Emergency Vehicles", AAAI, vol. 36, no. 4, pp. 4593-4601, Jun. 2022.

H. Su, Y. D. Zhong, B. Dey, and A. Chakraborty, "A decentralized reinforcement learning framework for efficient passage of emergency vehicles," arXiv.org, 20-Feb-2022. [Online]. Available: https://arxiv.org/abs/2111.00278.

C. You, W. Dai, F. Liu, **H. Su**, X. Zhang, L. Staib, and J. S. Duncan, "Mine your own anatomy: Revisiting medical image segmentation with extremely limited labels," arXiv.org, 28-Sep-2022. [Online]. Available: https://arxiv.org/abs/2209.13476.

AWARDS AND CERTIFICATES

Dwight David Eisenhower Transportation Fellowship	10/2020
NYU School of Engineering PhD Fellowship	09/2019
C2SMART Student Scholarship	08/2018
Dean's List multiple semesters, UC Berkeley College of Engineering	2013 - 2017 various semesters
Udemy certificate: Deep Reinforcement Learning: Actor-critic Methods	
Udemy certificate: Deep Q Learning in PyTorch	

LEADERSHIP AND SERVICE

Vice President of ITE NYU Chapter	2019 - present
President of Chi Epsilon, Engineering Honor Society at UC Berkeley Chapter	2016 - 2017

Reviewer for AAAI, NeurIPS, ICLR, IEEE ITSC, IEEE Magazine on ITS, Transportation Research Part B, C, E