CHARLOTTE PARK

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RESEARCH INTERESTS

Causal Inference, Statistics, ML Theory, Algorithms, Theoretical Computer Science

EDUCATION

Massachusetts Institute of Technology, Ph.D. in Computer Science — August 2022 - May 2027
Advised by Prof. Devavrat Shah

California Institute of Technology, B.S. in Computer Science — October 2018 - June 2022
GPA: 4.1/4.3

The University of Edinburgh, Exchange Student — Fall 2020
School of Informatics

PUBLICATIONS

1. Sean Mann*, **Charlotte Park***, Devavrat Shah, Exploiting Observation Bias to Improve Matrix Completion *In submission* (2023)

APPLICABLE SKILLS

Languages	Python, Java, C, OCaml, MATLAB, Mathematica, Javascript
Libraries and Frameworks	Pytorch, Keras/Tensorflow, Opencilk, Git, Jupyter, Docker

RESEARCH EXPERIENCE

Massachusetts Institute of Technology — August 2022 - Present
Graduate Researcher (PhD Student) — *Cambridge, MA*
Advised by Prof. Devavrat Shah

- Working with historical data from an e-commerce platform to build a sequential simulator to model user behavior.
- Exploiting low-rank structure of data to evaluate various policy decisions in a data-efficient manner.
- Developing an algorithm to determine ideal policy by optimizing over a class of policies based on outcomes of interest.
- Using data to validate theoretical results derive a personalized model for each individual and then optimizing over all models to find desired recommendation system.

California Institute of Technology — October 2021 - June 2022
Undergraduate Researcher — *Pasadena, CA*
Advised by Prof. Leonard Schulman

- Worked on causal inference and causal identification algorithms in the DAG framework.
- Presented final work as senior thesis counting towards B.S. in Computer Science.
- Provided formal proof of the 3 rules of Do-Calculus, resulting in a document presented at the Causality Bootcamp workshop hosted by the Simons Institute.
- Rigorously proved hedge criterion in proof of correctness for the Sipser/Pearl causal identification algorithm.

Massachusetts Institute of Technology — June 2021 - August 2021
Visiting Undergraduate Researcher — *Cambridge, MA*
Advised by Prof. Charles E. Leiserson

- Optimized ray tracing engine in C while generating reproducible results.

- Parallelized code using OpenCilk and obtained profiling results on machines with up to 8 cores.
- Performed work-span analysis to analyze potential for parallelism. Optimized both serial and parallel code to obtain runtimes up to 75 times as fast as original code.

Massachusetts Institute of Technology June 2020 - August 2020
Visiting Undergraduate Researcher *Cambridge, MA*
Advised by Prof. Charles E. Leiserson

- Worked on optimization of child filtering in spatial partition trees using uncompressed and compressed tries.
- Examined various algorithmic techniques for constructing theoretically optimal tries.
- Developed and implemented heuristic algorithm for reordering trie codes in C.

PROFESSIONAL EXPERIENCE

Akamai Technologies June 2019 - September 2019
Software Engineering Intern *Cambridge, MA*

- Developed Java-based server for generating blame file detailing revision history of customer metadata.
- Integrated Git's blame feature in project to improve upon existing diff tool within Property Manager service available directly to customers.
- Attended daily Scrum Team meetings which provided a collaborative environment to discuss ideas and allow for a greater understanding of other projects within the company.

TEACHING EXPERIENCE

Algorithms (CS 38) March 2022 - June 2022
Head Teaching Assistant

- Instructor: Peter Schröder

Machine Learning and Data Mining (CS/CNS/EE 155) January 2022 - March 2022
Teaching Assistant, Graduate Level

- Instructor: Yisong Yue

Algorithms (CS 38) March 2021 - June 2021
Teaching Assistant

- Instructor: Peter Schröder

Introduction to Programming Methods (CS 2) January 2021 - March 2021
Teaching Assistant

- Instructor: Adam Blank

HONORS AND AWARDS

- MIT Presidential Fellow
- School of Engineering Exemplary Scholar, MIT

PROJECTS

Projection of COVID-19 Cases

- Developed model to project COVID-19 case rates given changes in policy.
- Trained LGBM model with state- and county-level data.
- Model could predict case rates n weeks in the future for arbitrary county and state datasets.

OUTREACH AND LEADERSHIP

LIDS DEI Committee May 2023 - Present
Student Representative

- Student representative on committee aiming to assess the state of community, climate, and diversity at MIT LIDS (Laboratory for Information and Decision Systems).
- Working to understand, identify, and recommend ways of improving inclusion and belonging at LIDS

MSRP (MIT Summer Research Program) January 2023
Application Reader

- Read applications and help select next cohort of MSRP participants, a summer program which offers research opportunities to students from underrepresented groups.

GAAP (Graduate Application Assistance Program) September 2022 - Present
Mentor

- Mentor students applying to PhD programs in EECS from underrepresented backgrounds.

Ruddock House Executive Committee February 2020 - February 2022
Social Manager

- Plan social events, manage events budget, and maintain social media for Ruddock House, one of the eight undergraduate houses at Caltech.