Jacob M. Chen

jacobchen01@gmail.com jmc8@williams.edu GitHub: jacobmchen https://jacobmchen.github.io

Education

Williams College, Williamstown, MA — Sept. 2019 – Dec. 2023
B.A. Major in Computer Science & Concentration in French and Francophone Studies; Cumulative GPA: 3.96
- **Award:** Sam Goldberg Prize for Best Thesis Presentation in Computer Science.
- **Dean's List** for all semesters from Fall 2019. Inducted into the Sigma Xi society for excellence in research.
- **Relevant Coursework:** Causal Inference, Machine Learning, Introduction to Statistical Modeling, Theory of Computation, Algorithm Design & Analysis, Algorithmic Game Theory, Advanced French
- **Study Abroad**: Université Paul-Valéry, Montpellier, France — Fall 2023

National Yang Ming Chiao Tung University (NYCU), Hsinchu, Taiwan — Fall 2020
- **Coursework:** Linear Algebra (A+), Introduction to French (A+), Introduction to Japanese (A+)

National Tsing Hua University (NTHU), Hsinchu, Taiwan — Fall 2020
- **Coursework:** Discrete Mathematics (A)

Harvard University, Cambridge, MA — Summer 2018
- **Coursework:** Principles of Physics: Mechanics (A), Introduction to Psychology (A)

International Bilingual School at Hsinchu Science-Park (IBSH), Hsinchu, Taiwan — June 2019
- **Awards:** Valedictorian, National Merit Scholarship Finalist, Harvard Book Prize

Publications

1. **Jacob M. Chen**, Daniel Malinsky, Rohit Bhattacharya, "Causal Inference with Outcome-Dependent Missingness and Self-Censoring," in Proceedings of the 39th Conference on Uncertainty in Artificial Intelligence (UAI), PMLR 216:358-368, 2023
   - **Acceptance rate 243/778=31.2%. Chosen for a poster spotlight presentation (32/243=13.2%).** The publication on the Proceedings of Machine Learning Research can be found here.
2. **Jacob M. Chen**, Rohit Bhattacharya, Katherine A. Keith, "Proximal Causal Inference with Text Data," 2024.
   - The arXiv preprint may be found here. We will be submitting this work to the Association for Computational Linguistics (ACL) in February, 2024.

Research Interests

- Causal Inference, Missing Data, Graphical Models, Measurement Error, Causal Discovery, Natural Language Processing, Machine Learning, Applications in Healthcare and the Social Sciences, Computer Science Education

Research & Projects

Proximal Causal Inference with Text Data, Williams College — June 2023 – Present
- Writing a paper with Professor Rohit Bhattacharya and Professor Katie Keith on creating a novel method that applies recent advances in zero-shot classification and natural language processing to proximal causal inference, a method for recovering causal effects in the presence of unmeasured confounding. We investigate the efficacy of our method in a healthcare application with semi-synthetic simulations drawn from the publicly available MIMIC-III dataset. Will be submitting this work to the Association for Computational Linguistics (ACL) in February 2024.

Senior Thesis in Computer Science, Williams College — Sept. 2022 – May 2023
- Wrote an undergraduate thesis titled "Causal Inference with Outcome-Dependent Missingness and Self-Censoring" with Professor Rohit Bhattacharya in the Computer Science department at Williams College. Only students who have demonstrated strong academic performance and potential at research are approved to write theses. Worked on covariate selection and causal effect estimation methods under a self-censoring outcome. Uploaded work as a Github repository. Received Sam Goldberg Prize for the thesis defense. The full thesis may be found here: here.
- Nominated by Williams College for the 2024 Computing Research Association (CRA) Award for Outstanding Undergraduate Researchers. The department chooses 2 students to nominate each year.

Missing Data as a Causal Inference Problem, Williams College — Jan. 2022 – June 2022

– Worked closely with Professor Rohit Bhattacharya on graphical criteria for estimating causal effects under missing data and implementations for such criteria. Uploaded work as a Github repository. Explored the recoverability of missing not at random (MNAR) graphs and developed a criterion that takes advantage of conditional independencies in a missingness graph to recover causal effects under missing data.

Analyzing Association Rules in COVID-19 Symptoms, Taiwan Aug. 2020

– Independently mined association rules between COVID-19 symptoms and patients' travel history using the Apriori Algorithm on data of COVID-19 positive travelers entering Taiwan.

Conference Presentations

1. **Jacob M. Chen**, Daniel Malinsky, and Rohit Bhattacharya. "Causal Inference with Outcome Dependent Missingness and Self-Censoring." Poster spotlight presentation at Uncertainty in Artificial Intelligence (UAI), Pittsburgh, PA, July 31 - August 4, 2023.
2. **Jacob M. Chen**, Daniel Malinsky, and Rohit Bhattacharya. "Causal Inference with Outcome Dependent Missingness and Self-Censoring." Poster presentation at the American Causal Inference Conference (ACIC), Austin, TX, May 2023.
3. **Jacob M. Chen** and Rohit Bhattacharya. "On Covariate Adjustment in Missing Not at Random Models." Poster presentation at the American Causal Inference Conference (ACIC), Berkeley, CA, May 2022.

Work Experience

Computer Science Research Assistant, Williams College, Williamstown, MA June – Aug. 2023

– Worked on the "Proximal Causal Inference with Text Data" project advised by Professor Rohit Bhattacharya and Professor Katie Keith in a summer research program with Williams College.

Residential Teaching Fellow, Phillips Exeter Academy, Exeter, NH June – Aug. 2022

– Utilized Harkness pedagogy to instruct high school students in three courses – Introduction to Computer Science, Mobile App Development, and Game Programming – at a prestigious summer school program. Additionally, served as a dorm faculty for high school boys boarding in dormitories during the summer program.

Teaching Assistant in Computer Science Department, Williams College Feb. 2021 – May 2023

– Data Structures & Advanced Programming (Spring '21), Algorithm Design & Analysis (Spring '22), Introduction to Computer Science (Fall '21, Fall '22, & Spring '23)

Lanesborough Elementary School Teaching Fellow, Lanesborough, MA Jan. 2022 – May 2023

– Assisted in a 4th grade classroom with math and science courses and a kindergarten classroom with an English as a second language student. Gave a presentation introducing Taiwan and its culture to elementary school students.

Teacher for AP Computer Science, Nuts Institute, Hsinchu, Taiwan July 2020 – Jan. 2021

– Taught fundamentals of Java to high school students with no previous programming experience in preparation for the AP Computer Science A exam. Prepared my own class materials and lesson plans.

Software Engineer, Seknova Biotechnology Co., Taiwan June – Aug. 2019

– Designed and developed independently Windows graphical user interface tools in Java and developed an Android App for an external blood glucose monitoring device.

Community Service

Crisis Text Line, Remote Since Feb. 2021

– Crisis Text Line provides free, 24/7 support for people in crisis via a medium people already use and trust: text.

Leadership & Extracurricular Activities

– **Junior Advisor to the Class of 2025**, Williams College Fall 2021 – Spring 2022
– **Gospel Choir**, Williams College Fall 2019 – Spring 2023; President in 2022-23 Academic Year
– **Taiwanese Student Association**, Williams College Spring 2022 – Spring 2023; Co-Founder
– **International Orientation Leader for First-Year Students**, Williams College Fall 2022

Skills & Language

– English – Fluent, Mandarin – Fluent, French – Intermediate (A2/B1), Japanese – Basic
– Python Machine Learning & Causal Inference
– Computer: Android Java App Development, Python, Java, C, R