Jacob M. Chen

jmc8@williams.edu GitHub: jacobmchen LinkedIn: jacobmchen Website

Education

Williams College, Williamstown, MA — Expected Dec. 2023

B.A. Computer Science Major & French Concentration; Cumulative GPA: 3.96

- Dean's List for all semesters from Fall 2019. Inducted into the Sigma Xi society for excellence in research.
- **Awards:** Sam Goldberg Colloquium Prize in Computer Science for best student talk in computer science.
- **Relevant Coursework:** Causal Inference, Machine Learning, Introduction to Statistical Modeling, Theory of Computation, Algorithm Design & Analysis, Algorithmic Game Theory, Advanced French

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

- High school diploma
- **Awards:** Valedictorian, National Merit Scholarship Finalist, Harvard Book Prize

Publications

Causal Inference with Outcome-Dependent Missingness And Self-Censoring, UAI 2023 — Aug. 2023

- Paper accepted at Uncertainty in Artificial Intelligence (UAI) 2023, an internationally recognized conference in machine learning and causal inference. Full details of the paper will be published in August 2023. The arXiv pre-print can be found here.

Research Interests

- Causal Inference, Missing Data, Graphical Models, Natural Language Processing, Machine Learning, Computational Complexity, Artificial Intelligence, Computer Science Education

Research & Projects

Clinician's Notes as a Proxy for Missing Variables, Williams College — June 2023 – Aug. 2023

- Working with Professor Katie Keith and Professor Rohit Bhattacharya on applying natural language processing techniques to causal inference, specifically in the context of recovering from unmeasured or latent variables.

Thesis in Computer Science, Williams College — Sept. 2022 – May 2023

- Wrote an undergraduate thesis with Professor Rohit Bhattacharya as advisor 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 non-parametric causal inference methods, particularly that of covariate selection and causal effect estimation, under self-censoring treatments and outcomes. Uploaded work as a Github repository. Received High Honors for the thesis defense.
- Nominated by Williams College for 2023 Computing Research Association (CRA) Award for Outstanding Undergraduate Researchers.

Missing Data as a Causal Inference Problem, Williams College — Jan. – 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 developing a criterion that takes advantage of conditional independencies in a missingness graph as well as fixing variables 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

- Jacob M. Chen, Daniel Malinsky, and Rohit Bhattacharya. "Causal Inference with Outcome Dependent Missingness and Self-Censoring." Poster presentation at Uncertainty in Artificial Intelligence (UAI), Pittsburgh, Pennsylvania, August 2023.
- Jacob M. Chen, Daniel Malinsky, and Rohit Bhattacharya. "Causal Inference with Outcome Dependent Missingness and Self-Censoring." Poster presentation at American Causal Inference Conference (ACIC), Austin, Texas, May 2023.
- Jacob M. Chen and Rohit Bhattacharya. "On Covariate Adjustment in Missing Not at Random Models." Poster presentation at American Causal Inference Conference (ACIC), Berkeley, California, May 2022.

Work Experience

Computer Science Research Assistant, Williams College, Williamstown, MA — June – Aug. 2023
- Working on a natural language processing and causal inference project advised by Professor Katie Keith and Professor Rohit Bhattacharya.

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 students.

Teaching Assistant in Computer Science Department, Williams College — Since Feb. 2021
- Data Structures & Advanced Programming (Spring '21), Algorithm Design & Analysis (Spring '22), Introduction to Computer Science (Fall '21 & Fall '22)

Lanesborough Elementary School Teaching Fellow, Lanesborough, MA — Since Jan. 2022
- Assisted in 4th grade and kindergarten classrooms with math and science courses. 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.

AP Economics Substitute Teaching Assistant, IBSH, Hsinchu, Taiwan — Nov. 2020
- Acted as an interim substitute teaching assistant when a teacher had to take a sudden leave and explained problem sets and solutions to exams to high school juniors and seniors.

Software Engineer, Seknova Biotechnology Co., Taiwan — June – Aug. 2019
- Designed and developed 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. Currently volunteering four hours per week as a Crisis Counselor.

Leadership & Extracurricular Activities

- **Williams College Junior Advisor to the Class of 2025** — Fall 2021 – Spring 2022
  - Lived with, mentored, and supported first-year students as they transition to Williams. Led social activities and problem-solved with first-year students.
- **Williams College Gospel Choir** — Since Fall 2019; President in 2022-23 Academic Year
- **Taiwanese Student Association at Williams** — Since Spring 2021; Founder
- **International Orientation Leader for First-Year Students** — Fall 2022

Skills & Language

- English – Fluent, Mandarin – Fluent, French – Intermediate
- Python Machine Learning & Causal Inference
- Computer: Android Java App Development, Python, Java, C, R