

YUEN CHEN

EDUCATION

University of California, Berkeley

B.A. Applied Mathematics

B.A. Statistics

Expected Graduation: Dec 2022

GPA: 3.94/4.0

University of Copenhagen (University of California Education Abroad Program)

Department of Computer Science

Department of Mathematical Science

Feb 2022 - Jun 2022

GPA: 10.5/12

Irvine Valley College

Associate in Science in Mathematics

Aug 2018 - May 2020

GPA: 3.94/4.0

RESEARCH EXPERIENCE

Experimental Design with Orthogonal Array and Causal Inference

Aug 2022 - Present

Undergraduate Researcher Mentored by Zhijing Jin (PhD at Max Planck Institute & ETH)

- Conducted research to find an orthogonal array given the number of factors and a budget on the number of experiments.
- Reduced the number of experiments needed to compute causal relationships from 256 to 8.
- Provided an alternative experimental table to the one in the paper “Attention Is All You Need” by Vaswani et al.

100 Causal Graphs Test for Language Models

Aug 2022 - Present

Undergraduate Researcher Mentored by Zhijing Jin (PhD at Max Planck Institute & ETH)

- Collected 100 causal graphs with statements about the ground-truth causal relationships.
- Generated questions or statements that require causal reasonings for each graph to test GPT3 language model.
- Examined performance of language models in inferring causal relationships and detecting causal fallacies.

Multiarmed-bandits with Time-based Switching Costs

Feb 2022 - Jun 2022

Undergraduate Researcher Advised by Prof. Yevgeny Seldin — University of Copenhagen

- Conducted research to find an algorithm for multi-armed bandits problems with time-based switching costs that achieves optimal regrets in stochastic and adversarial regimes.
- Studied papers in multi-armed bandits problems and discussed findings with Prof. Yevgeny Seldin and a PhD student of Prof. Seldin.

HIGHLIGHTED PROJECTS

Time Series Analysis on Semiconductor Processing Tools

Fall 2022

Industrial Project Sponsored by Applied Material and UC Berkeley Data Science Department

- Developed a machine learning model to predict the performance of wafer production process.
- Condensed 560k+ data into 216 data by Fast Fourier Transform, sinusoidal regression, and quadratic regression.
- Achieved 87% prediction accuracy on wafer metrology with a linear regression model.

Offline Evaluation of Bandit Algorithms

Spring 2022

Online and Reinforcement Learning — University of Copenhagen

- Evaluated modified UCB1 and EXP3 with importance-weighted losses on “R6B Yahoo! Front Page Today Module User Click Log Dataset”.
- Investigated the performance of UCB1, EXP3, and random strategy compared to the theoretical performance bound.
- Achieved 2.6x better performance on EXP3 algorithm than the theoretical performance lower bound.

Medical Images Segmentation

Spring 2022

Elements of Machine Learning — University of Copenhagen

- Implemented U-Net with PyTorch to segment the blood vessels on photographs of the retina.
- Trained the neural network with sample-splitting and output segmented images for the test image data.
- Achieved <10% binary cross-entropy loss after 40 training epochs.

Representation Learning and Generative Modelling on MNIST Dataset

Spring 2022

Elements of Machine Learning — University of Copenhagen

- Performed dimensionality reduction on MNIST data using PCA, Autoencoder (AE), and Variational AE (VAE).
- Optimized binary cross-entropy loss of AE from 0.005 to 0.002 and evidence lower bound loss of VAE from 500+ to 200.
- Synthesized new image data by sampling from the latent space of VAE.

Independent Reading Project — Markov Chain and Convex Optimization

Fall 2021

Math Directed Reading Program — UC Berkeley

- Studied Markov Chains from Durrett's Essentials Stochastic Processes and theory part of Boyd's Convex Optimization.
- Conversated and summarized reading progress with my PhD student mentor in weekly meetings.
- Represented my team in a final delivery to present the geometric interpretation of Slater's condition and strong duality.

R Packages Text Analysis

Spring 2021

Concepts of Computing with Data — UC Berkeley

- Performed frequency text analysis by regular expression and visualized the outcome by ggplot2.
- Built a web application with R-shiny that demos the analysis of a distribution of R packages' title length.

Modified Brent's Method

Spring 2021

Numerical Analysis — UC Berkeley

- Implemented the root finding algorithm proposed by Wilkens and Gu in "A Modified Brent's Method for Finding Zeros of Functions" in MATLAB.
- Performed bisection method, inverse quadratic interpolation, and secant method alternatively to reduce the numbers of function evaluations.
- Achieved 92% test case coverage within tolerance of $1e-15$ in terms of efficiency.

PROFESSIONAL & LEADERSHIP EXPERIENCE

Statistics Course Reader

Sep 2022 - Present

UC Berkeley

- Assisted and graded 800+ students on homework, labs, exams weekly in Stat 20: Introduction to Statistics.
- Co-managed 8 sections of lectures with Prof. Andrew Bray and other course staff on course content.

Math Tutor

Aug 2019 - May 2022

Irvine Valley College

- Conducted 1-on-6 weekly sections and hosted office hours for 200+ students weekly.
- Designed weekly problem sets for teaching uses in fields of trigonometry, calculus, and differential equations.
- Earned 80% satisfaction in teaching from students in Fall 2021 and Spring 2022.

Commissioner of Budget and Finance Committee

Aug 2018 - Sep 2019

Associated Student Government of Irvine Valley College

- Coordinated with 6 other committees on planning and advertising campus events.
- Allocated \$800,000 in funds to student organizations, intercurricular programs, and scholarships.

TECHNICAL SKILLS

R/R Studio, Python, Microsoft Excel, MATLAB, and C++