Muyan Jiang

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EDUCATION

University of California, Berkeley — Berkeley, USA
PhD in Industrial Engineering & Operations Research — GPA: 3.91/4.0 — *Aug. 2022 – May 2026 (expected)*
 with Designated Emphasis in Computational Precision Health

New York University, Abu Dhabi — Abu Dhabi, UAE
Bachelor of Science in Mathematics, Computer Science — GPA: 3.95/4.0 — *Aug. 2018 – May 2022*

Relevant Courses: Mathematical Programming I/II, Stochastic Analysis, Scientific Computing, Deep Learning, NLP, Algo for Data Sci, SWE, Logistic Management, PDE, Complex Analysis, Algebra I/II, Advanced Stats, Topology

TECHNICAL SKILLS

Programming: Python, R, C/C++, C#, Java, SQL, Scope, HTML/CSS, Julia/JuMP, Mathematica, MatLab
DevOps: git, AWS, GCP (Google Cloud Platform), Microsoft Azure, Spark, Apache Hive, Postgres, Linux, OOP
Frameworks: PyTorch, TensorFlow, Jenkins, Hugging Face, H2O.ai

WORK EXPERIENCE

Wells Fargo, AI/ML Centers of Excellence — June 2024 – Aug. 2024
Quantitative Researcher Intern — *Charlotte, USA*

- Developed and fine-tuned large language models (LLMs) with Vertex AI on GCP to automate commercial banking credit memo generation, including unifying diverse format (i.e. pdf, textual, Excel) long financial documents using Retrieval-Augmented Generation (RAG) & OCR, significantly enhancing data accessibility for analysis & reporting
- Researched LLM evaluation methodologies, designed and implemented a comprehensive evaluation framework for financial summary analysis with unit tests & LLM-based validation approach. Proposed ∼30 metrics measuring model accuracy, hallucination, calculative errors, conceptual misunderstanding & domain knowledge expertise

Microsoft, Asia Software Technology Center — June 2021 – Aug. 2021
Software Engineering Intern — *Suzhou, China*

- Developed a sports news multi-labeling model for Bing's downstream ranking system, using graphical knowledge databases and structured neural networks (Python), achieving 100ms latency and 90%+ accuracy.
- Implemented crawling pipelines to extract, preprocess, and structure user query data (C#), reducing 30% processing time & enabling more efficient downstream feature engineering.
- Monitored and analyzed 10 million+ daily Bing regional search logs (C#, SQL), and managed a 5TB-scale database to ensure data integrity and accessibility.

RESEARCH PROJECTS

Matrix Analysis — May 2020 – Present
Researcher — *Abu Dhabi, UAE*

- Developed methods to compute numerical range generating polynomials for low-dimensional reciprocal matrices using Mathematica, and extended these findings to matrices of arbitrary dimensions.
- Established criteria for the ellipticity of the numerical range through the computation of the Kippenhahn curve, providing a unified heuristic approach for this analysis.

Optimal Contract Design for End-of-Life Care Payments — Sept. 2023 – Apr. 2024
Researcher — *Berkeley, USA*

- Developed a principal-agent model to design optimal contracts for end-of-life care, using bi-level optimization techniques to align provider incentives with patient outcomes and cost-efficiency.
- Performed simulations with real-world data to apply the derived contracts to pricing intracranial pressure monitoring for traumatic brain injuries, demonstrating cost savings and improved care quality.

Semiparametric Regression for Treatment-Covariates Interaction — Jan. 2023 – Jan. 2024
Researcher — *Berkeley, USA*

- Developed an interpretable semiparametric regression model using a dual-score system to estimate optimal individualized treatment strategies, focusing on the interaction between covariates and continuous treatments.
- Applied the model to a 6000-patient anticoagulant study, achieving SOTA results in treatment optimization and providing clinical insights on dosing strategies, leveraging patient-specific data and pharmacogenetic variables.

Covid-19 Epidemiological Research   May 2020 – Apr. 2021

Undergraduate Researcher   *Abu Dhabi, UAE*
- Simulated COVID-19 pandemic using the SEIR-model to suggest an optimal policy for schools to balance trade-offs between in-person classes and the spread of the virus (Mathematica, MatLab).
- Published a paper in *Scientific Report* on the eluding effect of school opening that mathematically explained the ambiguous role of school opening policy during the COVID-19 outbreak and the existence of a phase transition.

Lie Algebra   Jan. 2019 – Apr. 2020

Summer Undergraduate Researcher   *Abu Dhabi, UAE*
- Studied double extensions of restricted Hamiltonian Lie superalgebras preserving the non-degenerate closed 2-forms in characteristic p with non-constant coefficients.
- Computed filtered deforms of Skryabin modular Lie algebras over algebraically closed fields of characteristic 3 in the restricted case (Mathematica, Python).

PUBLICATIONS

M. Jiang, Y. Chen, X. Chen, J. Lavaei, and A. Aswani, "Optimal contract design for end-of-life care payments," *2024 Conference on Decision and Control*, 2024

M. Jiang and I. M. Spitkovsky, "Unified approach to reciprocal matrices with kippenhahn curves containing elliptical components," *Linear and Multilinear Algebra*, vol. 0, no. 0, pp. 1–23, 2024

M. Jiang, Y. Zhang, and A. Aswani, "Interpretable semiparametric regression for treatment-covariates interaction learning: A dual-score system," *ArXiv Preprint*, 2024

M. Jiang and I. M. Spitkovsky, "Numerical ranges of foguel operators revisited," *Operators and Matrices*, 2023

M. Jiang and I. M. Spitkovsky, "On some reciprocal matrices with elliptical components of their kippenhahn curves," *Special Matrices*, vol. 10, no. 1, pp. 117–130, 2022

M. Jiang, R. Fan, and O. Hussein, "Document classification with termolator for covid-19 literature," in *2021 IEEE MIT Undergraduate Research Technology Conference (URTC 2021)*, pp. 1–5, 2021

A. Gandolfi, A. Aspri, E. Beretta, K. Jamshad, and **M. Jiang**, "A new threshold reveals the uncertainty about the effect of school opening on diffusion of covid-19," *Scientific Reports*, vol. 12, p. 3012, Feb 2022

K. Dharmarajan, W. Panitch, **M. Jiang**, K. Srinivas, B. Shi, Y. Avigal, H. Huang, T. Low, D. Fer, and K. Goldberg, "Automating vascular shunt insertion with the dvrk surgical robot," *IEEE International Conference on Robotics and Automation (ICRA)*, 2023

CONFERENCE TALKS

M. Jiang, "*Optimal Contract Design for End-of-Life Care Payments.*" **2024 INFORMS Annual Meeting**, Advance Payment Model for Health

M. Jiang, "*Unified approach to reciprocal matrices with Kippenhahn curves containing elliptical components.*" International Workshop on Operator Theory and is Applications **(IWOTA 2024)**

M. Jiang, "*Numerical Ranges of Reciprocal Matrices.*" International Workshop on Operator Theory and is Applications **(IWOTA 2023)**

M. Jiang, "*Numerical ranges of Foguel operators revisited.*" ILAS Special Session on Matrices and Operators, 2023 Joint Mathematics Meetings **(JMM 2023)**

M. Jiang, "*Document Classification with Termolator for COVID-19 Literature.*" 2021 IEEE MIT Undergraduate Research Technology Conference **(URTC 2021)**

M. Jiang, "*Kippenhahn Curves of Some Reciprocal Matrices.*" 2021 Joint Mathematics Meetings **(JMM 2021)**

ACADEMIC SERVICE

INFORMS Annual Meeting 2024   Oct 2024

Session Co-Chair, Invited Session TA47 - Advance Payment Model for Health   *WA, USA*
- Co-chaired an invited session within the Health Applications Society cluster, focusing on advanced payment models for healthcare.

Conference on Decision and Control 2024   Dec 2024

Session Chair & Reviewer, Regular Session TuB07 - Game Theory IV   *Milan, Italy*
- Chaired a session on Game Theory, facilitating discussions on the latest research and advancements in the field.
- Reviewed two papers, providing constructive feedback to enhance the quality of research presented.

TEACHING EXPERIENCE

UC Berkeley: *INDENG 240 - Optimization Analytics, Fall 2024.* (Graduate Student Instructor)

UC Berkeley: *INDENG 256 - Healthcare Analytics, Spring 2024.* (Graduate Student Instructor)

UC Berkeley: *INDENG 172 - Probability and Risk Analysis for Engineers, Fall 2023.* (Graduate Student Instructor)

New York University: *CSCI-UA.0480 - Natural Language Processing, Fall 2021.* (Teaching Assistant)