Baikun (Leon) Leng

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EDUCATION

The Chinese University of Hong Kong, Shenzhen (CUHKSZ) Shenzhen, China
B.S. in Data Science and Big Data Technology | **CGPA:** 3.47/4.00 (Top 25%) Sep 2020 – May 2024

- **Relevant Courses:** Optimization, Operations Management, Machine Learning, Econometrics, Probability and Statistics
- **Honors:** Undergraduate Research Award (2022), Top Master's List (2021-2022), University Leadership Award (2021-2022), School of Data Science Outstanding Contribution Award (2021-2022), Dean's List (2020-2021)

The University of California, Berkeley Berkeley, CA
Visiting Student | **CGPA:** 3.51/4.00 Aug 2022 – May 2023

- **Relevant Courses:** Introduction to Data Modeling, Statistics and System Simulation (Ph.D. level), Applied Stochastic Process (Ph.D. level), Frontiers in Revenue Management (Ph.D. level), Simulation for Enterprise-scale System, Efficient Algorithms and Intractable Problems, Data Structures
- **Honors:** Undergraduate Research Apprentice Program Admission (Top 2%)

RESEARCH EXPERIENCE

Network Revenue Management problem under the Markov Choice Model (In Progress) Shenzhen, China
Supervisors: Gallego Guillermo & Zizhuo Wang & Yinyu Ye, CUHKSZ & Stanford University Aug 2023 – Present

- Built a Markov choice model for the network revenue management problem to characterize the trading process between buyers and sellers for multiple products, in which buyers continuously engage with sellers based on their bid prices until the transaction is completed or they exit the system
- Determined the optimal proportion of successful transactions for each product to maximize the overall revenue in the process
- Planned to introduce the prime-dual algorithm for solving the online version after solving the offline linear programming

Fairness in Blockchain-Enabled Insurance Adoption (In Progress) Remote
Supervisor: Rowena Gan, Southern Methodist University Jun 2023 – Present

- Aimed to optimize token distribution strategy among multiple agents such as insurance buyers, underwriters, and claim assessors in blockchain insurance, balancing between maximizing platform revenue and upholding different fairness standards within a mutual pool framework
- Conducted an in-depth analysis of top market-cap blockchain insurance projects, focusing on their whitepapers and economic models, which provided critical insights into the prevailing blockchain insurance ecosystem [**View Slides**]

Simulation for Video Game Server Under Different Matchmaking Strategies [View Report] Berkeley, CA
Supervisor: Zeyu Zheng, UC Berkeley Aug 2022 – Dec 2022

- Aimed to improve player retention by optimizing the matchmaking strategy
- Constructed a competitive game scenario by introducing random variables such as players' skill level, log-in time, match waiting time, and win/lose probability, and generated random variables based on the actual data from Lichess.org
- Designed the player matching algorithm based on the multi-state Markov model to stabilize the current win/loss probability of the players and thus reduce the dropout rate
- Compared three player matching strategies, fair matching, random matching, and Markov matching, via simulation, showing that the player retention rate improves, but the waiting time increases
- Introduced an artificial intelligence robot to match players whose waiting time exceeds a certain threshold, which significantly improves the retention rate

Two-stage Pollution Regulation of Competitive Carbon Markets [View Slides] Shenzhen, China
Supervisors: Costas Courcoubetis & Jiaqi Lu CUHKSZ June 2022 – Sep 2022

- Aimed to construct an optimal firm policy in the carbon market based on investment, production, and pollution abatement
- Divided the policy into two stages: an investment stage (resulting in high/low abatement ability) and a production stage (in which firms can decide their optimal production quantity and pollution abatement level), to maximize whole process profits under the constraints of pollution regulation
- Utilized the concept of Nash equilibrium to delineate equilibrium boundaries in the investment stage for N firms as functions of emission cap and cost and visualized how the equilibrium outcomes shift by plotting the boundary curves in Python
- Conducted numerical tests via Python and theoretical proof via Mathematica to show the existence and the number of multi-equilibriums, revealing that the asymptotic behavior converges rapidly as the number of firms increases

INDIVIDUAL PROJECTS & Ph.D. COURSE PROJECTS

Assortment Planning for Two-Stages Personalized Recommendations [View Report] Berkeley, CA
Supervisor: Rajan Udwani, UC Berkeley Jan 2023 – May 2023

- Built a two-stage personalized recommendation model under the assumption that retailers can give an assortment at the first stage based on customer preference and offers second stage assortment based on what customer put in the cart in the first stage

- Proved that the one-customer Multinomial Logit (MNL) model & Markov choice model are poly-time solvable by backward induction. Further deduced that all one-customer fundamental choice models are poly-time solvable
- Used dynamic programming by the simulation to show that the M-customer choice model is exponential to customer number

Queuing Simulation under Heavy Traffic Conditions [View Report] Berkeley, CA

Supervisor: Zeyu Zheng, UC Berkeley Jan 2023 – May 2023

- Reviewed literature on queueing simulations, specifically single-queue systems with First-Come-First-Service (FCFS) discipline and heavy-traffic scenarios; Studied the impact of heavy-traffic assumptions, covering key concepts like run lengths, budgets, and variance reduction

Sequential Subspace Change-Point Detection [View Report] Shenzhen, China

Supervisors: Liyan Xie, CUHKSZ Jun 2022 – Aug 2022

- Studied papers related to first-order optimal sequential subspace change-point detection and multi-sensor change-point detection for seismic tremors; Applied change-point detection in low-dimension datasets using SVD decomposition, CUSUM algorithms, and likelihood ratio test

WORKING EXPERIENCE

Mandala Ventures Co., Ltd. Remote

Research Intern May 2023 – Jun 2023

- Conducted an independent study of Ether Staking and liquidity Staking derivatives, highlighting technical details, prospects, and current hurdles, and completed an in-depth research report [**View Report**]
- Presented a comparative analysis of CEX and DEX and conducted an in-depth study of "Aboard" (a decentralized derivatives exchange) from the perspective of the competitive landscape and investment logic [**View Report**]

US Arctic Research Commission (USARC) Berkeley, CA

Data Analyst Intern Feb 2023 – May 2023

- Collaborated with the U.S. Arctic Research Commission to investigate the intricate dynamics of Arctic cooperation among the U.S., Russia, and China
- Collected data from NASA/NSF datasets, cleaned the data, and performed exploratory data analysis (EDA)
- Showcased research insights through a comprehensive report and an on-campus academic poster session [**View Poster**]

Nothing Research Co., Ltd. (Venture Capital) Remote

Blockchain Researcher & Investment Analyst Intern Jan 2023 – Apr 2023

- Responsible for conducting research on the blockchain industry and sourcing A-round projects to help investment decisions
- Authored an eighty-page presentation, "The Dawn of Web3: Unveiling the Blockchain Universe" [**View Slide**]
- Created multiple tools and frameworks for interns and blockchain newcomers, such as the "case analysis memo," a project sourcing guide, and the "How to Find Data in Web3" resource, facilitating efficient industry navigation
- Collaborated with the Nex Gen Venture Team to author "Our View on 2023 and Beyond" [**View Report**], featuring ten pivotal points that cover all subfields of the blockchain ecosystem
- Authored a detailed "Y2K Finance" analysis [**View Report**], providing mathematical and financial insights

SERVICES & ACTIVITIES

UCSB-ECON DeFi Seminar (UCSB-EDS) Remote

External Organizer Oct 2023 – Present

- Developed a platform compiling a list of blockchain-related seminars, broadening awareness of diverse seminar focuses
- Enhanced the platform to support graduate students' industry aspirations, facilitating collaborations with blockchain labs and venture capitals for potential employment opportunities

Crypto and Blockchain Economics Research Forum (CBER) Remote

Database Administrator June 2023 – Present

- Created a database of blockchain-related papers from UTD-24 and top-5 Econ journals, detailing features such as journal name, relevant areas, keywords, and citation count
- Be supervised by Prof. Gerry Tsoukalas. Continuously responsible for updating new publications

School of Data Science Undergraduate Seminar (SDS-US) Shenzhen, China

Founder & Organizer Feb 2022 – Aug 2022

- Hosted globally renowned researchers and professors to deliver talks tailored for undergraduate students, aiming to educate, guide, and foster their understanding of diverse fields and cultivate their research interests [**View Past Talks**]
- Set up an online platform to help CUHK-SZ students find potential RA/Intern positions [**View Website**]