Sizhe Li

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EDUCATION

The Chinese University of Hong Kong, Shenzhen *Shenzhen, China*
Bachelor of Science in Statistics *Sep. 2022 – Present*
Cumulative GPA: 3.92/4.00, Major GPA: 3.98/4.00

University of California, Berkeley *California, USA*
Visiting Student *Aug. 2024 – Dec. 2024*
GPA: 4.00/4.00

No.1 Middle School Affiliated to Central China Normal University *Wuhan, China*
High School Diploma *Sep. 2019 – Jun. 2022*

RESEARCH EXPERIENCE

Prediction-Specific Design of Learning-Augmented Online Algorithms *Feb 2024 – May 2025*
Supervised by Prof. Tongxin Li and Dr. Nicolas Christianson

- Introduced a *prediction-specific framework* for learning-augmented algorithms enabling fine-grained, per-prediction performance guarantees.
- Proposed a novel definition of *strong optimality* capturing Pareto optimality in both consistency and robustness tradeoffs.
- Developed a *bi-level optimization* framework for designing strongly-optimal algorithms, applicable to diverse online problems.
- Proved the suboptimality of state-of-the-art methods (NeurIPS 2018, 2021) under this new tradeoff; designed provably optimal algorithms for *deterministic/randomized ski rental* and *one-max search*.

Lower Bounds in Learning-Augmented Non-Clairvoyant Scheduling *June 2025 – Oct 2025*
Supervised by Prof. Tongxin Li and Dr. Nicolas Christianson

- Ongoing work on the consistency–robustness trade-off in non-clairvoyant scheduling. Wei & Zhang (2020) present a lower bound that is only proven tight at $n = 2$ and two endpoints $\lambda = 0$ and $\lambda = 1 - 2/(n+1)$ for $n > 2$, where n is the number of jobs. This research demonstrates the bound is not tight when $n \geq 5$ and develops a refined near-optimal lower bound for general n.

PUBLICATIONS

- **Sizhe Li**, Nicolas Christianson, Tongxin Li. *Prediction-Specific Design of Learning-Augmented Online Algorithms*. Under Review.

PROJECTS

Simulation Model for ICU Resource Optimization, UC Berkeley *Aug. 2024 – Dec. 2024*

- Developed a discrete-event simulation to optimize ICU capacity using the MIMIC-IV demo dataset.

- Proposed patient prioritization based on severity and urgency, using dynamic penalty evaluation.
- Designed and compared three resource allocation solvers under varied load conditions.
- Conducted sensitivity analysis to evaluate model robustness and key performance drivers.

TEACHING

Undergraduate Teaching Fellow, CUHK-Shenzhen

- **MAT2041: Linear Algebra and Applications** Fall 2023, Spring 2025
- **CSC1001: Introduction to Computer Science: Programming Methodology** Fall 2025

HONORS AND AWARDS

- Dean's List, 2023–2025
- Academic Performance Scholarship (Top 1–3%), 2023–2024
- Undergraduate Research Award, 2025

SKILLS

- **Programming:** Python (NumPy, Pandas, SciPy), Java, R, MATLAB
- **Tools:** Git, Jupyter, Linux, Overleaf
- **Typesetting:** LaTeX