Bach ChiLe

Applied Mathematics PhD Candidate

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Education

Aug 2023–May 2025 **Master of Science in Financial Engineering**, *Lehigh University*, Bethlehem, PA, *GPA: 3.93/4.0*

Aug 2020–Jul 2023 **Bachelor of Commerce in Finance and Economics**, *University of Melbourne*, Melbourne, AU, *H1 – First Class Honors*

Research Interests

Financial Engineering, Optimization, Time Series Forecasting, Deep Learning, Robustness, Machine Learning in Finance

Awards and Honors

2024 Graduate Business Life Leadership Award, Lehigh University

2024 Center for Financial Services Research Fellowship, Lehigh University

2023 Director's Scholarship, Lehigh University

2022 Melbourne International Undergraduate Scholarship, University of Melbourne

2020 Bachelor of Commerce Global Scholarship, University of Melbourne

Publications

Preprints

2025 Le, B. C., Dao, T. V., Nguyen, B. T., & Chu, H. T. M. *Tight Robustness Certificates and Wasserstein Distributional Attacks for Deep Neural Networks*. arXiv preprint arXiv:2510.10000.

Working Papers

Moore, O. A., Mchiri, A., Grady-Moreno, A., & Le, B. C. *Identified but Dissatisfied: The Paradoxical Effects of Mixed Team Membership Configurations*. Manuscript in preparation.

Moore, O. A., Gibson, H. O., Henderson, S. J., & Le, B. C. *Modeling the Effects of Multiple Team Membership on Project Delay: The Role of Expertise Diversity and HR Policy*. Manuscript in preparation.

Research in Progress

Chu, H. T. M., Nguyen, B. T., & Le, B. C. *Wasserstein Distributional Robustness in Deep Learning: Lipschitz-Based Guarantees for Transformers*.

Le, B. C., & Nguyen, L. M. *Ensemble Modeling for Time Series Forecasting via Adaptive Distributionally Robust Optimization*.

Lamadrid, A. J., & Le, B. C. *Risk Management in Deregulated Commodity Markets: A Comparative Study of Stochastic, Robust, and Info-Gap Optimization Frameworks*.

Tang, S., & Le, B. C. *On the Optimality of Balanced Pemantle's Min-Plus Binary Trees: A Probabilistic and Inductive Approach*.

Presentations

Jan 2025 Moore, O. A., Mchiri, A., Grady-Moreno, A., & Le, B. C. *Mixed versus Traditional Multiple Team Membership Configurations: Understanding Team Satisfaction through the Mediating Role of Identity and Moderating Effect of Intra-Team Conflict*. Presented at the INGRoup 2025 Midyear Conference, Virtual.

Research Experience

June 2025–Present **Research Assistant**, *VinUniversity*, Hanoi, VN
PI: Prof. Hong T. M. Chu
- Conduct comprehensive literature research and summarize relevant findings to support the research objectives, maintain an organized database of literature and references.
- Conduct advanced academic research and scientific computations with a focus on sensitivity analysis, designing algorithms and stabilizing networks.
- Assist teaching optimization topics in undergraduate course.

Sep 2024–May 2025 **Research Assistant**, *Lehigh University, Industrial and Systems Engineering*, Bethlehem, PA
PI: Prof. Lam M. Nguyen
- Develop an innovative Ensemble Modeling for Time Series Forecasting using the Adaptive Distributionally Robust Optimization (ADRO) framework.
- Conduct extensive theoretical formulation and empirical testing to establish the effectiveness of the ADRO framework.
- Provide mathematical proofs to derive a tractable robust counterpart for the original ADRO formulation.

Apr 2024–May 2025 **Research Assistant**, *Lehigh University, Economics Department*, Bethlehem, PA
PI: Prof. Alberto J. Lamadrid
- Conduct research on risk management strategies in deregulated commodity markets.
- Implement advanced optimization models, including Stochastic Optimization, Robust Optimization, and Info-Gap Decision Theory frameworks.
- Perform mathematical and numerical analysis to compare the effectiveness of different models.

Jan 2024–May 2025 **Research Assistant**, *Lehigh University, Mathematics Department*, Bethlehem, PA
PI: Prof. Si Tang
- Investigate the optimality of balanced Pemantle's Min-Plus binary trees.
- Employ R to compute probability density functions and expected values.
- Develop induction hypotheses from computational insights.

Nov 2023–May 2025 **Research Assistant**, *Lehigh University, Management Department*, Bethlehem, PA
PI: Prof. Ozias A. Moore
- Engineer datasets by embedding Level 2 variables into a Level 1 dataset using Group Mean Centering and Grand Mean Centering techniques.
- Conduct Monte Carlo simulations to bootstrap data and assess mediation effects.
- Support research on Team Configuration (Multiple Team Membership) using Andrew Hayes' PROCESS Model 7.

Professional Experience

Jun 2024–Aug 2024 **Complex Securities & Financial Instruments Intern**, *Stout Risius Ross*, New York, NY

- Applied option pricing models and conducted Monte Carlo simulations to accurately value complex derivatives.
- Conducted real options analysis to assess the value of investments in commodities and low-stage companies.
- Performed portfolio valuations and credit rating regressions using Excel, VBA, and R.

May 2024–Apr 2025 **Mathematics Consultant**, *Outlier AI*, San Francisco, CA

- Create and refine training prompts and solutions across diverse mathematical fields to train Large Language Models (LLMs).
- Formulate innovative mathematical problems and engage in rigorous math-focused conversations.
- Evaluate and rate AI-generated responses to mathematical prompts based on rigorous standards.

Apr 2023–Apr 2024 **Research Consultant**, *WorldQuant*, Hanoi, VN

- Developed and optimized alpha strategies for USA and China markets using technical indicators.
- Conducted extensive backtesting over a 10-year period to validate performance.

Technical Skills

Programming Python, R, SPSS, Latex, Pine Script, Excel VBA, SQL, C++, AMPL, MATLAB, Gurobi

Software SAS, Stata, VS Code, PyCharm, RStudio, MySQL, Microsoft Office, GitHub, QuantConnect