Ho Huu Binh

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Education

University of Science - Vietnam National University HCMC, Vietnam
MS, Mathematical Statistics *Expected Dec 2025*

- *Thesis (Proposed):* Model-based Clustering with Variable Selection for Missing Data
- *Supervisors:* Assoc. Prof. Hoang Van Ha (HCMUS), Dr. Nguyen Trung Tin (QUT)

International University - Vietnam National University HCMC, Vietnam
BS, Applied Mathematics *Aug 2018 - July 2022*

- *Thesis:* Forecasting Unit Sales of Retail Goods using Dynamic GLMs (DGLMs)
- *Supervisors:* Dr. Pham Hai Ha (HCMIU)
- *Honors:* First Prize, Vietnam National Olympic Econometrics Contest (2021); Third Prize, Scientific Conference for Students (2021)

Research Interests

- **Statistical Machine Learning:** Mixture Models, Model-based Clustering, High-Dimensional Statistics, Variable Selection, Generative Models, Deep Learning
- **Bayesian Statistics:** Approximate Inference, Bayesian Nonparametrics, Uncertainty Quantification
- **Time Series Analysis:** Representation Models, Probabilistic Forecasting, State-Space Models
- **Optimization:** Supply Chain Management, Portfolio Optimization, Convex and Non-Convex Programming

Publications & Preprints

[1] **Binh H. Ho**, Long Nguyen Chi, TrungTin Nguyen, Binh T. Nguyen, Van Ha Hoang, Christopher Drovandi - *A Unified Framework for Variable Selection in Model-Based Clustering with Missing Not at Random.* arXiv:2505.19093 [stat.ML]. (Preprint)

[2] Ta, B. Q., Huynh, V. T., Nguyen, K. Q. H., Nguyen, P. N., & **Ho, B. H.** (2022). *Maximal predictability portfolio optimization model and applications to Vietnam stock market.* In: Studies in Systems, Decision and Control. Springer. (Peer-reviewed Conference Proceedings, TES 2022)

Research Experience

Revisiting Parameter Balancing in Kinetic Models of Cell Metabolism (On Going)

- Developing a Bayesian (nonparametric) framework to robustly estimate kinetic parameters from sparse, noisy data, leveraging a Dirichlet Process mixture of Student's t-distributions to infer latent metabolic states and provide principled uncertainty quantification.
- This work aims to provide a more robust alternative to traditional methods for cell metabolism model.

Scalable Time Series Forecasting and Inventory Optimization

- Improved forecasting accuracy by **42%** over baselines by designing a novel, integrated ML and deep learning process for large-scale, high-granularity data.
- Designed an easy-to-optimize replenishment strategy that reduced warehouse deliveries while achieving near-**100%** storage utilization with **zero stock-outs**.

Deep Learning for Financial Risk and Portfolio Optimization

- Modeled conditional volatilities and forecasted Value at Risk (VaR) using a NeuralNet-GARCH model, demonstrating a **62%** enhancement in mean distance error over ARIMA-GARCH benchmarks.
- Increased portfolio Sharpe ratio by **23%** over an equally weighted portfolio by designing a deep learning model with an integrated attention mechanism.
- Developed an optimization model to capture market predictability by solving a non-convex fractional quadratic program, achieving a **6%** increase in investment efficiency over the Mean-Variance benchmark.

Industry Experience

Manulife HCMC, Vietnam

Product Development Intern *May 2022 – Nov 2022*

- Analyzed insurance product cash flows to detect anomalies and derived premium rates for critical illness products using statistical analysis in R.
- Automated data retrieval from data lakes using SQL to validate product specifications and support market research.

FPT Japan - Usee HCMC, Vietnam

Inventory Optimization and Forecasting Intern *May 2021 – Nov 2021*

- Improved sales forecast accuracy by **5%** by applying probabilistic forecasting models to mitigate the impact of zero-sales phenomena in demand data.
- Developed and evaluated inventory management policies for pharmaceutical SKUs, focusing on mitigating stockout risks through statistical modeling.

Technical Skills

- **Programming:** Python, R (incl. Rcpp), SQL
- **ML/Stats Libraries:** PyTorch, NumPyro, Pyro, PyMC3, Nixtla, Darts, GluonTS, Scikit-learn
- **Optimization:** GUROBI, CVXPy, Pulp, OR-Tools

References

- **Assoc. Prof. Hoang Van Ha**
  Lecturer, Faculty of Mathematics and Computer Science
  University of Science, VNU-HCMC
  Email: hvha@hcmus.edu.vn

- **Dr. Nguyen Trung Tin**
  Lecturer, School of Mathematical Sciences
  Queensland University of Technology (QUT)
  Email: t600.nguyen@qut.edu.au

- **Dr. To Duc Khanh**
  Lecturer, Faculty of Mathematics and Computer Science
  University of Science, VNU-HCMC
  Email: tdkhanh@hcmus.edu.vn