

Duc Manh Nguyen

B.Sc. – Mathematics & Informatics

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Professional Summary

I am a recent graduate in Mathematical Informatics with a strong passion for Machine Learning, Artificial Intelligence, Deep Learning, AI agents, and their mathematical foundations. My academic background in linear algebra, optimization, statistics, and calculus provides me with a solid quantitative foundation for solving complex data-driven problems. I am eager to apply my knowledge and continuously expand my technical expertise through research and real-world projects. With a strong learning mindset and problem-solving skills, I aim to contribute effectively to developing practical and impactful AI-driven solutions.

Education

2022 – 2026 **B.Sc. – Mathematics & Informatics**, *Hanoi University of Science and Technology*,
(exp. July) Ha Noi, Viet Nam
GPA: **3.67/4.0** (9.18/10.0)
Selected coursework: Optimization Methods (A+), Probability & Statistics (A+), Data Structures & Algorithms (A), Database (A), Encryption & Algorithm Complexity (A+), Numerical Analysis (B), System Analysis & Design (A)

Publications

- 2025 · Q1 **Highly Efficient Prediction of Beating Phenomena in Laminated Nanocomposite Plates Using a Hybrid Neural–Numerical–Analytical Framework**
Journal *European Journal of Mechanics – A/Solids*, 116 (2026), 105844. DOI: [10.1016/j.euromechsol.2025.105844](https://doi.org/10.1016/j.euromechsol.2025.105844)
Contribution: Neural network architecture design, model training & evaluation (Stage 1 surrogate model).
- Under Review **Adaptive Hard–Soft Physics-Informed Neural Networks for Robust Boundary-Constrained PDE Solving**
Manuscript under review.
Contribution: PINN implementation, formal analysis & writing review.

Academic Activities

- 2025 – Research Student, [Materials and Structures Group \(MAS\) Group](#), Hanoi University
Present of Science and Technology
- 07/2025 VIASM Student Summer School in Mathematics – Applied Mathematics Track, FPT
University, Da Nang (*competitive selection*)
- 2022 – Member, Applied Mathematics & Informatics Club (AMIC), Faculty of Mathematics
Present & Informatics, HUST

2026 – Participant, [VINIF Talent Program](#), VINIF
Present

■ Achievements

2023 – HUST Scholarship for Excellent Academic Performance (Semesters 2023.1, 2023.2,
Present 2024.1, 2024.2)

2025 Mirae Asset Foundation Scholarship Program

2024, 2025 Certificate of Achievement – Excellent Student, AY 2023–2024, Faculty of Mathematics and Informatics, HUST

[Proof of achievement](#)

■ Experience

2025 **Software Developer Intern**, *1C Vietnam*, Ha Noi, Viet Nam

- Developed a **retail pharmacy chain management system** using 1C:Enterprise, implementing modules for inventory tracking, sales management, supplier orders, and automated reporting.
- Gained hands-on experience with enterprise software architecture, business process modelling, and relational database configuration on the 1C platform.

■ Technical Skills

ML/DL PyTorch, TensorFlow, Scikit-learn, YOLO,

Programming Python, C/C++, C#, SQL, Git, Jupyter, 1C:Enterprise

Data Tools Pandas, NumPy, SciPy, Matplotlib, Seaborn, OpenCV, Apache Spark, Hadoop, Apache NiFi, Apache Oozie

Languages English (TOEIC 790); Vietnamese (Native)

Certifications MOS Excel; Coursera – Machine Learning Specialization (DeepLearning.AI); Advanced Learning Algorithms; SQL for Data Science; Python for Everybody; Worldquant brain certificate

■ Projects

2025/3 - **Automatic Multiple-Choice Answer Sheet Grading System**

2025/6 *Computer Vision · Official Faculty project · In production at Dept. of Mathematics & Informatics, HUST*

- Built an end-to-end pipeline for automatic recognition of filled/unfilled answer bubbles under real-world conditions (poor scan quality, partial erasures, varied lighting).
- Constructed dataset via Roboflow (collection, annotation, augmentation); trained and optimised YOLOv8 achieving **mAP@0.5 $\approx$ 99%** on the held-out test set.
- Designed OpenCV preprocessing stages (deskew, binarisation, noise removal) to normalise diverse input image qualities before inference.
- Implemented **K-means clustering** post-processing to spatially map detected bubbles to logical answer positions, enabling fully automated scoring.
- Contribution recognised with an **official certificate of active participation** from the Faculty.

2025/9 - **Aviation Data Warehouse – Flight Delay & Cancellation Analytics**

2026/1 *Big Data · Deployed on physical enterprise server (12 vCores, 31 GB RAM)*

- Designed and deployed a **Galaxy Schema** data warehouse on a physical Hadoop cluster; automated end-to-end ingestion pipeline with Apache NiFi and Apache Oozie – zero manual intervention.
- Achieved **91.47% storage reduction** via Parquet/Snappy compression and **6.1× query speedup** over traditional row-based storage through partitioning and optimised schema design.
- Validated all benchmarks on live hardware (not simulated); resolved production-grade compatibility and permission issues in a real enterprise environment.
- Built analytical dashboards for delay pattern analysis by airline, route, season, and airport.

2026/02 – **AgenticTS – Agentic AI Multi-Agent Framework for Time Series Forecasting**

2026/05 *Agentic AI · LLM Reasoning · Multi-Agent Systems · Research paper*

- Proposed **AgenticTS**, a reasoning-driven multi-agent framework automating the end-to-end forecasting pipeline; formalised as a constrained sequential decision process $\pi_{orch} = \pi_{safety} \circ \pi_{diag} \circ \pi_{model} \circ \pi_{refine}$ with hierarchical memory (episodic / semantic / vector).
- Implemented **9 specialised agents** (Orchestrator, Guardrail, Ingestion, Diagnostics, Feature, Model Strategy, Training, Evaluation, Report) with LLM reasoning via **Gemini 2.5 Flash Lite** on a containerised orchestration layer.
- **Diagnostic-constrained model selection**: ADF stationarity test, ACF/PACF, Z-score outlier & seasonality detection dynamically narrow the search space for **ARIMA, LSTM, DLinear** – replacing brute-force Grid/AIC search.
- Evaluated on **Hanoi Energy, Hanoi Weather, ETTh1** over horizons 96/192/336/720 (univariate & multivariate); beat vanilla baselines in most settings, e.g. **–10.6% MAE** and **–27.6% MSE** vs. Auto-ARIMA on Hanoi Energy ($H=96$).
- Ablation study isolating the Feature / Diagnostics / Model Strategy agents proved their symbiotic contribution; every stage logged to a **traceable JSON manifest** for full reproducibility.