Tuan Anh Dao

(Senior) Software Engineer

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I am currently a PhD in Computer Science specializing in high-performance scientific computing. I have a strong passion for high-quality software, big data, clean code, and years of industrial experience in software development. I also have experience in industrial real-time systems, and solving research-level logistic optimization problems. My most used languages are: C++, Java, SQL, Python.

Work Experience

2017 - now **Student Researcher & Teaching Assistant, Uppsala University, Sweden**

Advisor: Assoc. Prof. Murtazo Nazarov and Prof. Ken Mattsson

My research focuses on high-performance computer methods for large-scale simulations of magnetohydrodynamics. The library that we developed has strict mathematical proofs for accuracy and stability, and with optimal scaling on supercomputers.

2015 - now **Freelance Full-stack Developer**

I have been working solo on freelance projects involving web development and automation services.

Some of the finished projects (with consent to disclose):

- ionetour(dot)com
- botta(dot)it
- instapack(dot)me
- dienhoa360(dot)com
- blaorubiafarm(dot)com
- 54(dot)180(dot)217(dot)189 (automated database)

2016 - 2017 **Quantitative Developer, Worldquant LLC, Hanoi, Vietnam**

Worldquant is a multi-billion-size hedge fund and quantitative investment firm.

Duties: build trading strategies (called alphas) by simulating equity positions using historical market data. Markets: US (NASDAQ 100, Top 3000), EU. During the period of 7 months, 200+ of my alphas passed all the QA tests. 11 of them were selected into the production pool to be used in real trades.

2014 - 2016 **Full-stack Developer, SkyMap Global Ltd, Branch Hanoi, Vietnam**

SkyMap Global is a leading international company in satellite and aerial imagery.

Duties: I was the Scrum master for a team of 7 working on web services within the areas of real-time tracking, imagery change detection, and forest fire monitoring. Product releases: Kolkarta Traffic Police (a real-time tracking app for the government of India), SalesTrekk (a real-time tracking Business Intelligence platform).

Education

2017-2019 **Master of Science in Computer Science, Uppsala University, Sweden**

GPA: 4.94/5

Full scholarship (SISS 2017/2018) by Swedish Institute

Courses include:

- Parallel Programming for Efficiency
- High-performance Programming

2012-2017 **Bachelor of Science in Applied Mathematics and Informatics, Hanoi University of Science and Technology, Vietnam**

Ranked among top 5 students in class in all five years

Awards: university scholarship (2014, 2015, 2016) for academic excellence

Courses include:

- Mathematical models in economics
- Data structures and algorithms
- Programming techniques
- Advanced database

Publications

I am an author of following papers:

1. Monolithic parabolic regularization of the MHD equations and entropy principles. *Tuan Anh Dao, Murtazo Nazarov*: Computer Methods in Applied Mechanics and Engineering, 398, 115269. Journal paper
2. A high-order residual-based viscosity finite element method for the ideal MHD equations. *Tuan Anh Dao, Murtazo Nazarov*: Journal of Scientific Computing, 92(3), 1-24. Journal paper
3. Energy stable and accurate coupling of finite element methods and finite difference methods. *Tuan Anh Dao, Ken Mattsson, Murtazo Nazarov*: Journal of Computational Physics, vol. 449, pp. 110791. Journal paper
4. A high order accurate finite difference method for the Drinfel'd-Sokolov-Wilson equation. *Ludvig Lindeberg, Tuan Dao, Ken Mattsson*: Journal of Scientific Computing, vol. 88, no. 18. Journal paper
5. A Monotonic Optimization Approach for Solving Strictly Quasiconvex Multiobjective Programming Problems. *Thang Tran Ngoc, Vijender Kumar Solanki, Tuan Anh Dao, Thi Ngoc Anh Nguyen, Van Hai Pham*: Journal of Intelligent & Fuzzy Systems, vol. 38, no. 5, pp. 6053-6063. Journal paper
6. A multi-criteria optimization model for emission-concerned multi-depot vehicle routing problem with heterogeneous fleet. *Tuan Anh Dao and Ngoc-Anh Nguyen Thi*: ICASS 2018 (IEEE). Conference paper

7. Optimizing vehicle routing with path and carbon dioxide emission for municipal solid waste collection in Ha Giang, Vietnam. *Tuan Anh Dao, Ngoc-Anh Nguyen Thi, Khanh Nguyen-Trong, Anh Bui-Tuan and Dinh-Thi-Hai Van*: INISCOM 2017 (EAI). Conference paper

Technical skills

Language	Experience	Competence
C++	5 years working experience and favorite language. Developed professionally in industry and in my PhD.	High
Java	2 years working experience. Developed professionally in the industry (Android) and in my bachelor's level research.	High
SQL	5+ years working experience of MS SQL, PostgreSQL, and MySQL.	High
Python	A part of my PhD research code and several hobby projects were in Python. I also taught Python to Master students	High
PHP	10+ years. I used PHP since secondary school for my personal projects. I kept working with it during my jobs.	High

Hobby projects

Here are my recent personal projects:

1. Several open-source implementations for scientific computing on: github(dot)com/tuananhdao
2. A platform for Vietnamese students in Sweden: duhocsinh(dot)se (sole developer)
3. An Retrieval-Augmented-Generation AI chatbot specialized for helping international students in Sweden: swedenmentor(dot)github(dot)io

Honours and awards

1. Håkansson scholarship (2018), Liljewalchs scholarship (2022, 2023), Stenholm, Wilgott scholarship (2022) by Uppsala University
2. Winner: Volvo Group Transportation of Tomorrow Innovation Challenge 2018
3. Best student research project in Applied Mathematics and Informatics (awarded by Grooo International JSC., 2017)
4. First prize – 34th Student Research Competition – Hanoi University of Science and Technology (2017)
5. Gold medal (September 2016) – WorldQuant Challenge (a world-renowned competition in Quantitative Research, now renamed to Worldquant BRAIN).

References

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