

Dũng (Dzung) Nguyen Manh

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Personal Statement

I am deeply interested in embedding AI into software systems to automatically address complex coding challenges and assist developers to streamline traditional software workflows. In recent projects, my aim was to improve the comprehension capabilities of LLMs in various coding tasks, develop an AI-powered chatbot to assist developers in their daily tasks, and create an evaluation framework to assess the code-understanding capabilities of LLMs. My goal is to transform software development into something more efficient and accessible by developing intelligent agents/assistants that understand, generate, and optimize source code, reducing manual intervention and minimizing errors.

Education

University of Engineering and Technology, VNU, Bachelor of Science Sept 2018 – July 2022

- GPA: 3.61/4.0
- Thesis grade: 4.0/4.0
- **Honours degree** in Computer Science
- **Thesis Topic: A Universal Toolkit for Executing, Managing and Tracking Machine Learning Experiments.**
I developed a comprehensive MLOps solution featuring universal templates and a command-line interface (CLI) for streamlined training and fine-tuning of machine learning models. The toolkit also included experiment management for key artifacts (e.g., checkpoints, data versions) and automated syncing of experiment results for enhanced usability.

Publications

[Submitted ICLR'25] **CodeMMLU: A Multi-Task Benchmark for Assessing Code Understanding Capabilities of CodeLLMs** Oct 2024

Dung Nguyen Manh, Thang Phan Chau, Nam Le Hai, Thong T Doan, Nam V Nguyen, Quang Pham, Nghi DQ Bui

[Submitted NAACL'25] **On the Impacts of Contexts on Repository-Level Code Generation** Jun 2024

Nam Le Hai, *Dung Nguyen Manh*, Nghi DQ Bui

[EMNLP'23] **The Vault: A Comprehensive Multilingual Dataset for Advancing Code Understanding and Generation** Oct 2023

Dung Nguyen Manh, Nam Le Hai, Anh TV Dau, Anh Minh Nguyen, Khanh Nghiem, Jin Guo, Nghi DQ Bui

[Preprint] **Viwoz: A multi-domain task-oriented dialogue systems dataset for low-resource language** Mar 2022

Phi Nguyen Van, Tung Cao Hoang, *Dung Nguyen Manh*, Quan Nguyen Minh, Long Tran Quoc

Research Experience

Research Resident, FPT Software AI Center – Hanoi, Vietnam Sept 2022 – Present

(Top 50 AI Laboratories Worldwide)

- Released a novelty benchmark, with $\approx 19.9k$ questions on software knowledge and 5 foundation tasks to measure the LLMs' ability to understand and reason about coding problems.
- Fine-tuned and instruction-tuned LLMs and proposed a synthesis pipeline to create high-quality data input for advancing LLMs understanding. Resulting in a superior score of 81.8% and 53.84% in pass@1 of HumanEval compared to their base and instructed model, respectively.
- Released a massive dataset for enhance Language model understanding on various coding task. The dataset contains of 30 millions high-quality code-text pairs from 10 common programming languages, resulting in $\approx 17.6\%$ improvement on Code Summerization and $\approx 28\%$ superiority on Semantic Code Search compare with models fine-tuned on other datasets.

Undergraduate Research student, University of Engineering and Technology, VNU
– Hanoi, VN

May 2020 – Oct 2022

- Developed and experimented with key components of the task-oriented dialogue system in a low-resource Vietnamese project. Involved in the annotating process of transforming a large-scale enrich dataset to Vietnamese resources.
- Involved in the annotating process of a multi-camera multi-object tracking project.

Industry Experience

Conversation factual validation-based LLMs for retail banking sales training May 2024 - Sept 2024

- Developed a generic retrieval-augmented generation system for factual validation by LLM and retrieved related documents directly from clients, resulting in a 19.66% increase in soundness and $\times 2$ in time performance.
- Deployed Google cloud platform (GCP) for serving and monitoring LLMs; FlaskAPI and Docker to host API entry and deliver the application.
- Deployed Redis database to store documents and embeddings; optimized serving retrieval components with transform query and re-ranking techniques, marked 83.76% on target in RAG results.

[POC] ViMedicine: LLMs agency for suggesting medicine and predicting potential disease Oct 2023 - Dec 2023

- Develop a medical assistant for diagnosing illness based on patient-reported symptoms and suggesting medicine for doctors.
- Collect symptoms and illness data from Mayo Clinic; deploy a Milvus database to host and semantically query input for the language model.

[POC] Coding assistant-based LM on VSCode (extension) for various daily tasks Mar 2023

- Developed a VSCode Editor extension for assisting coding tasks: code translation, code generation, testcase generation, and documentation generation.
- Collected data and fine-tuned models; deployed and served models with the Triton Inference Server.

Awards

Panasonic Scholarship Program for Vietnamese Undergraduate Students 2020 – \$1,200

Certificate of Appreciation for Great contribution to society activities 2020 – Issued by VNU-UET

Municipal 5-Good Student 2019, 2020, 2021 – Issued by Vietnamese Student's Association

Skills

Linux and High-performance computing (HPC): Experiment in working with HPC cluster (A100s, H100s) in training, fine-tuning and inferencing.

Language protocol server and tree-sitter: Experiment in tree-sitter's programming languages grammars; building, extracting, and querying information from abstract syntax tree and code snippets; redirecting and searching using language servers.

Tools and Technologies: Experiment with ML/DL framework: Pytorch, Huggingface, Scikit-learn, Vllm/TGI; software development frameworks: Docker, FlaskAPI, Redis; and other data analysis tools: Numpy, Pandas.

Programming languages: Python, Java, JavaScript, C++.

Languages: English—Full professional proficiency; Vietnamese—Native.

References

Dr. Nghi D. Q. Bui Head of AI at FPT Software AI Center, Vietnam; Senior Research Scientist at Salesforce AI Research; Principal Research Scientist at Huawei Ireland Research Center, **Email:** NghiBDQ@fpt.com

Dr. Quang Pham Research Scientist at the Machine Intelligence Department; Institute for Infocomm Research (I2R); A*Star, **Email:** quangg2012@gmail.com

Dr. Long Quoc Tran Director of the Institute for Artificial Intelligence, VNU University of Engineering and Technology (UET); Senior Lecturer at UET, **Email:** tqlong@vnu.edu.vn