

Nghi D. Q. Bui

PH.D. IN COMPUTER SCIENCE

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Summary

As a seasoned professional with expertise in both academia and industry, my research interests include Software Engineering, Natural Language Processing, and Machine Learning. I bring a unique blend of practical experience and theoretical knowledge to these fields, and my work centers on developing intelligent software engineering tools that utilize deep learning techniques and software engineering principles to enhance the productivity of software developers.

In summary, my key skills and achievements include:

- 7 years of industry experience in software engineering, product development and AI research.
- Experience in teaching and mentoring students in research projects.
- Strong knowledge of software engineering development processes and tools.
- Experience in large-scale system design and program analysis techniques
- Hands-on experience with neural network implementation and design.
- Extensive experience leading research teams in AI and data science.
- Publication of papers in prestigious conferences across various domains in Computer Science, such as Software Engineering (ICSE, ESEC/FSE, ASE), Artificial Intelligence (NeurIPS, AAAI), Natural Language Processing (EMNLP) and Information Retrieval (SIGIR).

Education

Singapore Management University

PH.D. IN COMPUTER SCIENCE

Singapore

August 2016 - August 2020

Ho Chi Minh University of Science

BACHELOR IN COMPUTER SCIENCE

Ho Chi Minh, Viet Nam

August 2009 - August 2013

- Advanced Program in Computer Science (honor program)

Work Experience

FPT Software AI Center

MENTOR/HEAD OF SOFTWARE RESEARCH DEPARTMENT

Ho Chi Minh, Viet Nam

November 2021 - Now

- Conducting research on AI for Software, mentoring top-tier students for the AI Residency program (<https://ai.fpt-software.com/ai-residency/>).
- Consulting on internal and external AI-based projects to boost software development productivity of the organization.

Fullbright University, Viet Nam

ADJUNCT RESEARCH PROFESSOR

Ho Chi Minh, Viet Nam

Jan 2023 - Now

- Mentor and supervise students as they conduct research in various Data Science topics.
- Involve in designing and developing courses related to Computer science, Engineering, and Data Science.

Intelligent Software Lab, Singapore Management University & Salesforce Research Asia

RESEARCH MANAGER/VISITING RESEARCH FELLOW

Singapore

February 2022 - Now

- Responsible for leading a team of researchers, including Ph.D students, postdocs, AI engineers, and software developers, in a collaboration between Singapore Management University and Salesforce Research Asia. Our focus is on conducting advanced research in AI for software development with the goal of significantly increasing the productivity of software developers.
- Involved in teaching courses related to AI-based System Design, Software Project Management, and the Fundamentals of Software Development

Trustworthy & Software Engineering Lab, Huawei Research, Ireland

PRINCIPAL RESEARCH SCIENTIST

Dublin, Ireland

July 2019 - October 2021

- Conduct multi-disciplinary cutting edge research across machine learning, software engineering and programming languages.
- Lead RuleGen, a project that aims to use a combination of deep learning and compiler theory to convert C++ code into Rust. The goal of this project is to convert billions of lines of C++ code to Rust.

Noggin Asia

HEAD OF DATA SCIENCE

Singapore

March 2017 - July 2020

- Supervised and manage the tasks for junior member of the team.
- Designed ML system architecture to process and collect a large volume of user's personal data, such as geolocation, website activities, etc.
- Used statistical modeling to model user's behavior.
- Developed recommendation system for item recommendation on client's website.

- Collaborated with the researchers in the two universities to work on the topic: "Interpretability Method for Program Representation Learning". The goal for this research is to propose techniques that can interpret the output of neural networks that are being applied to solve a wide range of problems in software systems

Atlassian

Ho Chi Minh City, Viet Nam

SOFTWARE ENGINEER

January 2014 - March 2015

- Worked as a software engineer on the JIRA Service Desk team, developing useful libraries and features for internal usage, such as creating logging management dashboards to measure service quality.
- Ensured the quality of the source code by writing test cases and performing code reviews.

Skills

Distributed Computing & Streaming	Kafka, RabbitMQ, Spark, Hadoop
Machine Learning & Analytics	Tensorflow, Pytorch, Keras, Pandas, Scikit-learn, SciPy, Numpy, Pyplot
Programming Languages	Python, Java, Scala, Javascript, Matlab, C/C++
Source Code Version Control	Git, SVN
Back-end Development	Spring Framework, Play Framework, NodeJS, Flask
Database	MySQL, PostgreSQL, MongoDB, Redis, Elasticsearch
DevOps	Docker, Ansible

Publications

[EMNLP'22] Detect-Localize-Repair: A Unified Framework for Learning to Debug with CodeT5, by **Nghi D. Q. BUI**, Yue Wang, Steven Hoi, in Proceedings of the The 2022 Conference on Empirical Methods in Natural Language Processing, Full Paper in Findings Track, Abu Dhabi, United Arab Emirates, 2022

[ASE'22] Towards Using Data-Centric Approach for Better Code Representation Learning, by Anh T.V Dau, **Nghi D. Q. BUI**, Thang Nguyen Duc, Hoang Thanh Tung, in Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering, Late-Breaking Results Track, 2022, Michigan, US.

[ASE'22] Towards Robust Models of Code via Energy-Based Learning on Auxiliary Datasets, by **Nghi D. Q. BUI**, Yijun YU, in Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering, Late-Breaking Results Track, 2022, Michigan, US.

[JST'21] On the Generalizability of Neural Program Analyzers with respect to Semantic-Preserving Program Transformation, by Md. Rafiqul Islam RABIN, **Nghi D. Q. BUI**, Yijun YU, Lingxiao JIANG, Mohammad Amin ALIPOUR, accepted at the Journal of Information and Software Technology, 2022.

[SIGIR'21] Self-Supervised Learning for Code Retrieval and Summarization through Semantic-Preserving Program Transformations, by **Nghi D. Q. BUI**, Yijun YU, Lingxiao JIANG.

[ICSE'21] InferCode: Self-Supervised Learning of Code Representations by Predicting Subtrees, by **Nghi D. Q. BUI**, Yijun YU, Lingxiao JIANG, in Proceedings of the IEEE/ACM 43th International Conference on Software Engineering, Full Paper, Technical Track, Madrid, Spain, 2021.

[AAAI'21] TreeCaps: Tree-based Capsule Networks for Source Code Processing, by **Nghi D. Q. BUI**, Yijun YU, Lingxiao JIANG, Full Paper, Main Track in Proceedings of the 35th AAAI Conference on Artificial Intelligence (AAAI), Vancouver, Canada

[NeurIPS'19] TreeCaps: Tree-Structured Capsule Networks for Program Source Code Processing, by Vinoj Jayasundara, **Nghi D. Q. Bui**, Lingxiao Jiang, David Lo, in NeurIPS Workshop on ML for Systems, 2019, Vancouver, Canada.

[ASE'19] AutoFocus: Interpreting Attention-based Neural Networks by Code Perturbation, by **Nghi D. Q. BUI**, Yijun YU, Lingxiao JIANG, in Proceedings of the 34th IEEE/ACM International Conference on Automated Software Engineering (ASE 2019), Research Track, New Ideas Papers, San Diego, California, United States, 2019.

[ESEC/FSE'19] SAR: Learning Cross-Language API Mappings with Little Knowledge, by **Nghi D. Q. Bui**, Yijun Yu, Lingxiao Jiang, accepted at the IEEE/ACM 27th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Research Track, Tallinn, Estonia, 2019.

[ICSE'19] Towards Zero Knowledge Learning for Cross-Language API Mappings, by **Nghi D. Q. BUI**, in Proceedings of the IEEE/ACM 41th International Conference on Software Engineering (ICSE): ACM Student Research Competition Track (SRC), Montreal, Canada, 2019 - (**Bronze Medal**).

[SANER'19] Bilateral Dependency Neural Networks for Cross-Language Algorithm Classification, by **Nghi D. Q. Bui**, Yijun Yu, Lingxiao Jiang, in the 26th edition of the IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER), Research Track, Zhejiang University in Hangzhou, February 24-27, 2019.

[ICSE'18] Hierarchical Learning of Cross-Language Mappings through Distributed Vector Representations for Code, by **Nghi D. Q. Bui**, Lingxiao JIANG, in Proceedings of the IEEE/ACM 40th International Conference on Software Engineering (ICSE): New Ideas and Emerging Technologies Results Track (NIER), Gothenburg, Sweden, 2018 - (**ACM SIGSOFT Distinguished Paper Award**).

[NL4SE-AAAI'17] Cross-Language Learning for Program Classification Using Bilateral Tree-Based Convolutional Neural Networks, by Nghi D. Q. Bui, Lingxiao JIANG, and Yijun YU. In the proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI) Workshop on NLP for Software Engineering, New Orleans, Louisiana, USA, 2018.

Honors & Awards

2019	SMU Dean's List , Ph.D. Program	<i>Singapore</i>
2019	SMU Presidential Doctoral Fellowship , Ph.D. Program	<i>Singapore</i>
2019	ACM SIGSOFT Travel Grant Award , ESEC/FSE 2019	<i>Tallinn, Estonia</i>
2019	Bronze Medal , ACM Student Research Competition, ICSE 2019	<i>Montreal, Canada</i>
2019	ACM SIGSOFT Travel Grant Award , ICSE 2019	<i>Montreal, Canada</i>
2018	ACM SIGSOFT Distinguished Paper Award , ICSE 2018	<i>Gothenburg, Sweden</i>
2016	Ph.D. Scholarship from the Singapore Ministry of Education , Ph.D Program	<i>Singapore</i>

Teaching Experience

IS706: Software Mining and Analysis: Teaching Assistant

IS212: Software Project Management: Teaching Assistant

CS403: Introduction to Software Development: Lecturer

IS345: Advances Topic in AI-based Techniques for Software Development: Lecturer

Academic Service

Program Committee: Mining Challenge Track, the 18th Mining Software Repository (MRS 2021).

Program Committee: Shadow PC Track, the 18th Mining Software Repository (MRS 2021).

External Reviewer: the 36th International Conference on Software Maintenance and Evolution (ICSME 2021).

External Reviewer: the 36th International Conference on Software Maintenance and Evolution (ICSME 2021).

References

Associate Prof. Lingxiao JIANG, School of Computing & Information Systems, Singapore Management University <http://www.mysmu.edu/faculty/lxjiang/>

Associate Prof. Yijun YU, Research Director, Trustworthy & Software Engineering Lab, Huawei Research Ireland, <https://www.open.ac.uk/people/yy66>

Associate Prof. Steven Hoi, Vice President, Salesforce Research Asia, <https://sites.google.com/view/stevenhoi/home>

Dr. Phong Nguyen, Chief AI Officer, FPT Software AI Center, <https://ca.linkedin.com/in/xphongvn>