# DR. HOANG H. NGUYEN

### Postdoctoral Researcher in Machine Learning, Graph Learning & Software Security

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♥ Chattanooga, Tennessee, USA

**21.01.1990** 

Married

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## WORKING EXPERIENCE

#### Postdoctoral Researcher

### CUIP, University of Tennessee at Chattanooga

- Focus on federated learning to advance research and application in the field
- Develop modern machine learning solutions for trajectory prediction at traffic intersections
- Utilize decentralized data sources to improve prediction accuracy and reliability in real-world scenarios
- Ensure solutions adhere to privacy and security standards throughout the development process, maintaining the integrity of sensitive data

August 2024 - Present

**Q** USA

### **Doctoral Researcher**

### L3S Research Center, Leibniz University Hannover

- Utilizing graph embeddings to enhance investigative capabilities by predicting unseen connections in crimnal networks
- Employing graph representation learning for vulnerability detection in blockchain smart contracts
- Applying graph neural networks to analyze data from cubelet sensors to enhance the accuracy of predicting multiple object trajectories
- Developing a database to manage and analyze large-scale blockchain-powered social network data

## February 2020 - July 2024

**♀** Germany

### Research Collaborator

#### **HCMC University of Technology - HCMUT**

- Modeling Ethereum smart contracts' control flow and data dependency
- Applying machine learning to analyze Bitcoin and Ethereum transaction security vulnerabilities
- Analyzing real-time data of warehouse and transportation management systems integrated with Ethereum and EOS blockchain

♥ Vietnam

### Research Assistant & Research Associate

### Singapore Management University

- Generating control-flow graphs and data dependencies of Android platform
- Analyzing Android apps behaviors based on whole-system control flow
- Identifying private data leaks in Android framework APIs
- Context-aware code localization and recommendation

Mar 2016 - March 2018

Singapore

### Android Developer & Android Team Leader

### Fabrica Vietnam Co., Ltd & EFSE Co., Ltd

- User experience analysis using Material Design
- QR Code and Image Processing technologies
- Payment Processing technologies (NFC)
- Analyzing Android native launcher
- Designing new techniques for floating apps
- Building apps related to Coupon & Auction, Car Selling, Overlay Photos, Android Launcher, NFC, Call Blocker, and Location

**◊** Vietnam

## RESEARCH INTERESTS

Graph Learning Machine Learning
Network Analysis Program Analysis
Software Security Smart Contracts

## **EDUCATION**

Tr. rer. nat. (Ph.D.) in Computer Science

#### Leibniz University Hannover

Grade: Very Good / Magna Cum Laude Thesis: Graph Representation Learning for Security Analytics in Decentralized Software Systems and Social Networks

**♀** Germany

# M.Eng. in Computer Science

### **HCMC University of Technology - HCMUT**

Computer Security - Grade: Good Thesis: Generating Control-Flow Graph from Android Binary Code

## April 2017

**◊** Vietnam

# **B.Sc.** in Electronics and Telecommunications

### **HCMC University of Science - HCMUS**

Computer and Embedded Systems - Grade: Fair

**◊** Vietnam

# **TECHNICAL SKILLS**

Python **Javascript** Solidity Java PvTorch PvG **DGL** NetworkX SKLearn Ethereum Hive Soot Google Cloud APIs Git Android SDK NodeJS KnockoutJS D3JS

# **RESEARCH SKILLS**

Report Writing Presentation

Self Motivation Teamwork

Problem Solving Critical Thinking

# **FEATURED PROJECTS**

5GAPS ROXANNE MANDO
SoChainDB LibraryGURU

Kurumaerabi Android Launcher

## **REVIEWS**

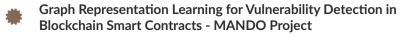
#### **CONFERENCES:**

- AAAI Conference on Artificial Intelligence (AAAI 2025, 2024, 2023)
- International Conference on Software Engineering (ICSE 2025, 2018)
- International Conference on Software Maintenance and Evolution (ICSME 2024)

#### **JOURNALS**:

- Information and Software Technology, Elsevier (2024, 2023)
- IEEE Transactions on Network and Service Management, IEEE (2024)
- IEEE Network Magazine, IEEE (2024)
- IEEE Transactions on Dependable and Secure Computing, IEEE (2024)
- IEEE Transactions on Information Forensics and Security, IEEE (2024)
- IEEE Transactions on Software Engineering, IEEE (2024)
- Knowledge-Based Systems, Elsevier (2023)
- IEEE Transactions on Multimedia, IEEE (2022)

### LIST OF PUBLICATIONS

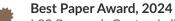


- Nguyen, H. H., Nguyen, N.M., Xie, C., Ahmadi, Z., Kudenko, D., Doan, T. N., & Jiang, L. (2023, May). MANDO-HGT: Heterogeneous Graph Transformers for Smart Contract Vulnerability Detection. In Proceedings of 20th International Conference on Mining Software Repositories. (Rank A)
- Nguyen, H. H., Nguyen, N.M., Doan, H.P., Ahmadi, Z., Doan, T. N., & Jiang, L. (2022, November). MANDO-GURU: Vulnerability Detection for Smart Contract Source Code By Heterogeneous Graph Embeddings. In Proceedings of the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (pp. 1736-1740). (Rank A\*)
- Nguyen, H. H., Nguyen, N.M., Xie, C., Ahmadi, Z., Kudenko, D., Doan, T. N., & Jiang, L. (2022, October). MANDO: Multi-Level Heterogeneous Graph Embeddings for Fine-Grained Detection of Smart Contract Vulnerabilities. In Proceedings of the 9th IEEE International Conference on Data Science and Advanced Analytics (pp. 1-10). (Rank A)
- Bang, T., Nguyen, H. H., Nguyen, D., Trieu, T., & Quan, T. (2020).
   Verification of ethereum smart contracts: a model checking approach. International Journal of Machine Learning and Computing, 10(4).

# Graph Similarity Learning on Multi-Target Multi-Camera Object Tracking

- Nguyen, T.T., Nguyen, H.H., Sartipi, M., and Fisichella, M. (2024). LaMMOn: Language Model Combined Graph Neural Network for Multi-Target Multi-Camera Tracking in Online Scenarios. Machine Learning Journal. (Q1 Journal)
- Nguyen, T.T., Nguyen, H.H., Sartipi, M., and Fisichella, M. (2023). Multi-Vehicle Multi-Camera Tracking With Graph-Based Tracklet Features. IEEE Transactions on Multimedia. (Q1 Journal)
- Nguyen, T.T., Nguyen, H.H., Sartipi, M., and Fisichella, M. (2023). Real-Time Multi-Vehicle Multi-Camera Tracking With Graph-Based Tracklet Features. Journal of Transportation Research Record. (Q2 Journal)

# **ACHIEVEMENTS**



L3S Research Center, Leibniz University Hannover

Two Best Paper Awards, 2023
L3S Research Center, Leibniz
University Hannover

SIGSOFT CAPS: ICSE 2023 Travel Grants, 2023

45th International Conference on Software Engineering, ICSE 2023

Silver Award \$7000 at Blockchain Hackathon, 2018
Vietnam Blockchain Hub

\*\* SMU Internship Scholarship for Excellent Graduate Students, 2016 HCMC University of Technology

500,000 app downloads, 2015 Google Play store

# **EXTERNAL LINKS**

### ★ Homepage:

https://hoanghnguyen.com

% Google Scholar:

https://scholar.google.com/citations?user=cDB2Tt8AAAAJ

% DBLP:

https://dblp.uni-trier.de/pid/200/9071.html **D ORCID:** 

https://orcid.org/0000-0003-0611-4634

in LinkedIn: https://www.linkedin.com/in/mrerichoang

Github: https://github.com/erichoang

# **REFERENCES**

Prof. Dr.-techn. Wolfgang Neidl

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■ Leibniz University Hannover

Prof. Dr. Lingxiao Jiang

@ lxjiang@smu.edu.sg

■ Singapore Management University

### Prof. Dr. Mina Sartipi

@ mina-sartipi@utc.edu

■ University of Tennessee at Chattanooga

### Dr. Zahra Ahmadi

@ ahmadi.zahra@mh-hannover.de

# Graph Representation Learning for Criminal Network Analysis - ROXANNE Project - https://roxanne-euproject.org/

- Ahmadi, Z., Nguyen, H. H., Zhang, Z., Bozhkov, D., Kudenko, D., Jofre, M., Calderoni, F., Cohen, N., & Solewicz, Y. (2023).
   Inductive and transductive link prediction for criminal network analysis. *Journal of Computational Science*, 102063. (Q1 Journal)
- Nguyen, H. H., Bozhkov, D., Ahmadi, Z., Nguyen, N. M., & Doan, T. N. (2022, July). SoChainDB: A Database for Storing and Retrieving Blockchain-Powered Social Network Data. In Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2022) (pp. 3036-3045). (Rank A\*)
- Nguyen, T. H., Nguyen, H. H., Ahmadi, Z., Hoang, T. A., & Doan, T. N. (2021, December). On the Impact of Dataset Size: A Twitter Classification Case Study. In IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology (pp. 210-217). (Rank B)
- Maly, K., Backfried, G., Calderoni, F., Černocký, J., Dikici, E., Fabien, M., Hořínek, J., Hughes, J., Janošík, M., Kovac, M., Motlicek, P., Nguyen, H. H., Parida, S., Rohdin, J., Skácel, M., Zerr, S., Klakow, D., Zhu, D. & Krishnan, A. (2021). ROXSD: a Simulated Dataset of Communication in Organized Crime. In ISCA Symposium on Security and Privacy in Speech Communication, Virtual Event, 10-12 November 2021 (pp. 32-36).
- Fabien, M., Parida, S., Motlícek, P., Zhu, D., Krishnan, A., &
   Nguyen, H. H. (2021). ROXANNE Research Platform: Automate Criminal Investigations. In *Interspeech* (pp. 962-964). (Rank A)
- Nguyen, H. H., Zerr, S., & Hoang, T. A. (2020, December). On Node Embedding of Uncertain Networks. In 2020 IEEE International Conference on Big Data (Big Data) (pp. 5792-5794). IEEE. (Rank B)

# Android API Recommendation System - Library GURU Project - http://libraryguru.info

- Yuan, W., Nguyen, H. H., Jiang, L., Chen, Y., Zhao, J., & Yu, H. (2019). API recommendation for event-driven Android application development. *Information and Software Technology*, 107, 30-47. (Q1 Journal)
- Yuan, W., Nguyen, H. H., Jiang, L., & Chen, Y. (2018, May).
   LibraryGuru: API recommendation for Android developers. In Proceedings of the 40th International Conference on Software Engineering: Companion Proceedings (pp. 364-365). (Rank A\*)

### **Analyzing Android System Behaviors**

- Nguyen, H. H., Jiang, L., & Quan, T. (2017, May). Android repository mining for detecting publicly accessible functions missing permission checks. In 2017 IEEE/ACM 25th International Conference on Program Comprehension (ICPC) (pp. 324-327). IEEE. (Co-located ICSE 2017) (Rank A)
- Nguyen, H. H., Jiang, L., & Quan, T. T. (2017). Whole-system analysis for understanding publicly accessible functions in Android.(2017). In South East Asian Technical University Consortium (SEATUC) 11th Symposium Proceedings: Ho Chi Minh City, Vietnam, March 13-14.
- Hoang, N. H. (2016, June). Poster: Android whole-system control flow analysis for accurate application behavior modeling. In Proceedings of the 14th Annual International Conference on Mobile Systems, Applications, and Services Companion (pp. 30-30). (Rank B)