Quoc H. Nguyen

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SUMMARY

Data Scientist/Software Engineer with experience in developing robust AI applications using **Machine Learning (ML)/Deep Learning (DL)**. Ph.D. in Industrial Engineering with expertise in **applied research, software development, and project management**. Key interest areas include: **(1) Data Analytics; (2) Generative AI; (3) IoT and Edge Computing**.

EDUCATION

University of South Florida (USF) **Aug 2019 – Aug 2024**
*Ph.D. in Industrial Engineering (Specialized in **Machine Learning**). GPA: 4.0/4.0* *Florida, USA*

Kyung Hee University (KHU) **March 2014 – March 2016**
*M.Sc. in Computer Science and Engineering (Specialized in **Cloud Computing**). GPA: 3.9/4.0* *Yogin, South Korea*

Posts and Telecommunication Institute of Technology (PTIT) **Aug 2009 – Feb 2014**
*BS in Computer Science (Specialized in **Software Engineer**). GPA: 3.8/4.0* *Ho Chi Minh, Vietnam*

SKILLS

- Python (Scikit-learn, Pandas), Jupyter, SQL/NoSQL, TensorFlow, PyTorch, R, Tableau, Power PI, Rest API, Git, CLI
- Data Analytics, Statistics, Machine Learning, Deep Learning, NLP, AWS Sagemaker, AWS EMR
- Distributed Systems, IoT/Embedded Systems, Agile Development, Mobile Development, Full-Stack, English, Vietnamese

RELEVANT EXPERIENCE

University of South Florida - SPACHES Lab **Aug 2019 – Aug 2024**
Graduate Researcher *Florida, USA*

- Led a 4-person team in tackling industrial research utilizing ML/DL techniques (**SVM, Random Forest, Diffusion Models, CNN, NLP, GAN**) and cloud computing solutions (AWS/GCP) with Python, Scikit-learn, Numpy, Matplotlib, and Pytorch/Tensorflow. Research and achieved publications in **top-tier journals/conferences**. Secured a **$5 million NSF research grant**, and patented 1 **US invention**.
- Experienced in **Predictive Analytics, Transfer Learning, Privacy Preserving Machine Learning, and Generative AI** applications across healthcare, IoT, and cybersecurity sectors.

Center for Computationally Assisted Science and Technology Center (CCAST) **Aug 2021 – Aug 2022**
Research Scientist Intern *North Dakota, USA*

- Implemented cloud infrastructure with OpenStack & GPU hardware for VMs provisioning for 4 ML research groups.
- Consulted 20+ researchers on deploying VMs with necessary packages for seamless ML training on the cloud platform.

Vitalify Asia **May 2018 – Jun 2019**
Machine Learning Engineer *Ho Chi Minh, Vietnam*

- Designed and implemented enterprise industrial applications for Toyota Japan, driving monthly **revenue of $10 million** using Machine Learning/Deep Learning, Android, MongoDB and NodeJS.
- Experienced in modeling (**EDA/Feature selection, Model Deployment, Model Assessment/Validation, and advanced statistical methods**) using AWS Sagemaker and AWS EMR.

ISB **June 2016 – May 2018**
Software Engineer *Japan*

- Led the design and development of multiple enterprise-level mobile applications of Commerce Experience Group, driving **$2 million of revenue** every year using the latest technologies of **AWS, Android, SQL-Lite, and PHP**.
- Developed APIs for a high-volume delivery app with Amazon S3, RestAPI, handling **millions of user requests daily**.
- Continuous Integration/Deployment Pipeline Integration, pull requests, code reviews, load/stress testing, unit testing.

SELECTED PROJECTS [Github]

FedNIDS • Techstack: Deep Learning, TensorFlow, Jupyter Notebook | [Code] | [Publication] **2024**
- Developed a cyber-security Federated Learning DNN-based model for anomaly detection, achieving 98% accuracy.

Wearable Health IoT System • Techstack: C++, ESP32, AutoML, MLflow, Deep Learning | [Code] | [Publication] **2023**
- Created an MLOps framework for OSA detection using LSTM and cloud computing, benefiting 80+ cancer patients at Sanford Health Hospital and aiding in early health issue detection.

Diffusion Model for MRI Synthesis • Techstack: Diffusion Model, Computer Vision | [Code] | [Publication] **2022**
- Led a team of 4 scientists in designing and implementing a diffusion model, which led to a 20% improvement in image quality metrics compared to conventional methods (GANs).

Katok (Startup) • Techstack: Machine Learning, Android, Flutter, PHP, MongoDB | [Code] **2018**
- Designed a fullstack hair salon app with ML-driven product recommendations, attracting **8,000+ users in 6 months**.

SELECTED PUBLICATIONS & PATENTS

1. **Quoc H. Nguyen***, Soumyadeep Hore, Ankit Shah, Trung Le, and Nathaniel D. Bastian, "FedNIDS – A Federated Learning Framework for Packet-based Network Intrusion Detection System", ***ACM Digital Threats: Research and Practice***, 2024, https://dl.acm.org/doi/10.1145/3696012. [PDF]

2. **Quoc H. Nguyen***, Thang Nguyen, Minh Nguyen, Trung Le, "Class Label Conditioning Diffusion Model for Robust Brain Tumor MRI Synthesis", ***IEEE Computational Intelligence Magazine***, 2023 (Under review.). [PDF]

3. **Quoc H. Nguyen***, Chau Le, Chuan Pham, Minh Nguyen, Dung Nguyen, Arveity Setty, Trung Le, "A Hybrid Data-Centric and Model-Centric Approach Towards Robust Single-Lead ECG Obstructive Sleep Apnea Diagnosis", ***Elsevier Engineering Applications of Artificial Intelligence***, 2023 (Under review). [PDF]

4. Tien-Dung Nguyen, Pham Phuoc Hung, Tran Hoang Dai, **Quoc H. Nguyen**, Cong-Thinh Huynh, Eui-Nam Huh, "Prediction-based energy policy for mobile virtual desktop infrastructure in a cloud environment", ***Elsevier Information Sciences***, pages 132-151, ISSN 0020-0255, https://doi.org/10.1016/j.ins.2015.02.022.2016. [PDF]

5. Dinh-Mao Bui, **Quoc H. Nguyen**, YongIk Yoon, SungIk Jun, Muhammad Bilal Amin, Sungyoung Lee, "Gaussian process for predicting CPU utilization and its application to energy efficiency", ***Springer Applied Intelligent***, 874–891 (2015). https://doi.org/10.1007/s10489-015-0688-4. [PDF]

Peer-reviewed Conferences

1. Soumyadeep Hore, **Quoc H. Nguyen***, Yulun Xu, Ankit Shah, Nathaniel Bastian, Trung Le, "Empirical Evaluation of Autoencoder Models for Anomaly Detection in Packet-based NIDS", ***In Proc. of the 6th IEEE Conference on Dependable and Secure Computing (IEEE DSC)***, Tampa, USA, 2023. [PDF]

2. **Quoc H. Nguyen***, Quang Dang, Chuan Pham, Tien-Dung Nguyen, Hang Nguyen, Arveity Setty, Trung Le, "Developing an Architecture for IoT Interoperability in Healthcare-A Case Study of Real-time SpO2 Signal Monitoring and Analysis", ***In Proc. of the IEEE International Conference on Big Data (IEEE BigData)***, Atlanta, USA, 2020. [PDF]

3. **Quoc H. Nguyen***, Ton Thi Kim Loan, Bui Dinh Mao, Eui-Nam Huh, "Low cost real-time system monitoring using Raspberry Pi", ***In Proc. of the 7th IEEE International Conference on Ubiquitous and Future Networks (IEEE ICNGC)***, Sapporo, Japan, 2015. [PDF], *(100+ citations)*

4. Cong-Thinh Huynh, Tien-Dung Nguyen, **Quoc H. Nguyen**, Eui-Nam Huh, "Cloud-based Real-time location tracking and messaging system- A child-care case study", ***In Proc. of the 9th International Conference on Ubiquitous Information Management and Communication (ACM IMCOM)***, New York, USA 2015. [PDF]

Patents

1. Trung Le, **Quoc H. Nguyen**, "Smart IoT System for Longitudinal Real-time Physiological Monitoring of Cancer Patients Undergoing Treatment", *US Patent (pending)*, USF enclosure approved - USF24/00352.

HONORS & AWARDS

• IISE Future Faculty Fellow • USENIX's Student Grant ($500) • Graduate Student Council Research Grant ($500) • AI GPN Cyber Scholarship ($300) • Best Student Paper Award KCC Conference • IBM ACM-ICPC Programming Award ($200)

LEADERSHIPS

• Mentored 10+ students in research projects, Teaching Assistant for 4 courses (Under/Grad level) with 100+ students
• Computer Science Tutor/Leader: Programming, Data Science, Career Advice • Badminton & Vietnamese Groups President

CERTIFICATES

• LinkedIn Certified: Artificial Intelligence Foundations: Machine Learning • Coursera - Deep Learning Specialization