KHOA NGUYEN

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URL | Google Scholar | ResearchGate | ORCID

Research Interests

My primary research interests are in communication networks, with a focus on cloud and edge computing, including Parked Vehicle Edge Computing (PVEC), the Internet of Vehicles (IoV). I explore advanced technologies like software-defined networking (SDN), network function virtualization (NFV), and containerization to improve network flexibility and scalability. Additionally, I leverage artificial intelligence/machine learning (AI/ML) and evolutionary algorithms to optimize network performance and enhance system intelligence. I have authored 17 peer-reviewed publications in top journals and conferences within the networking field.

Education

Ph.D. in Electrical and Computer Engineering ***2015 - 2021***

- Department of Systems and Computer Engineering, Carleton University, Ottawa, ON **Canada**.
  Dissertation: *Distributed and Parallel Metaheuristic-based Algorithms for Online Virtual Resource Allocation*.
  Supervisor: *Professor Changcheng Huang.*

M.Sc. in Telecommunications Engineering ***2012 - 2013***

- Faculty of Computer Science, University of Sunderland, **United Kingdom**.

B.Eng. Degree in Electronics and Telecommunication ***2003 - 2008***

- College of Engineering Technology, Can Tho University, **Vietnam**.

Professional Experience

Postdoctoral Fellow **Mar, 2022 – Mar, 2023**

- School of Information Technology, Carleton University, Ottawa, ON, Canada.
  Supervisor: *Professor Wei Shi and Professor Marc St-Hilaire*.
  - Led an independent project on Virtual Network Embedding in the Internet of Vehicles, resulting in several peer-reviewed publications in one journal and three conferences.
  - Mentored graduate students by providing guidance on research topics, methodologies, and data analysis.
  - Presented research papers at international conferences, promoting academic engagement.

Research Associate **Dec, 2021 - Feb, 2022**

- Department of Systems and Computer Engineering, Carleton University, Ottawa, ON, Canada. Supervisor: *Professor Changcheng Huang.*
  - Conducted a research project on the Joint Node-Link Algorithm for Embedding Virtual Networks with a Conciliation Strategy, resulting in three impactful publications in renowned journals and conferences.
  - Worked collaboratively with fellow researchers, contributing insights and expertise to accomplish the project and achieve the research goals.
  - Presented research outcomes at two conferences, enhancing the visibility of the research within the academic community.

Research Internship **Jan, 2020 - Mar, 2021**

- BitQubic Corp., Ottawa, ON, Canada.
  - Executed specific research tasks on the Kubernetes system and Google Cloud Platform, contributing to the design and implementation of an expandable and reliable edge-computing platform while considering mobility and security constraints, and gaining hands-on experience.

- Collected and analyzed research data under the guidance of senior researchers, ensuring accuracy and adherence to methodologies.
- Prepared detailed documentation of research procedures, findings, and outcomes, contributing to project reports.
- Published research papers in a reputed journal and presented at two well-known conferences.

Instructor ***Sept, 2013 - Sept, 2015***

- Can Tho University of Technology, Can Tho, Viet Nam.
  - Developed and prepared course materials for Electrical Materials Engineering, including lecture notes, presentations, quizzes, assignments, and exams.
  - Conducted engaging course lectures in a dynamic and interactive learning environment, with precise assessments of student performance.
  - Incorporated student feedback to improve teaching methods and course content.
  - Provided guidance and support to students, addressing queries, concerns, and career paths.

Network Operation Center (NOC) Engineer ***Mar, 2009 - Nov, 2010***

- Viettel Telecom Company, Can Tho, Viet Nam.
  - Monitored network performance, promptly addressed issues, and analyzed alarms using monitoring and surveillance software.
  - Maintained and managed network infrastructure, implementing configuration changes and updates to optimize performance.
  - Collaborated with cross-functional teams, vendors, and service providers to address and resolve complex network issues.

Operation Management Center (OMC) Engineer ***Jun, 2008 - Mar, 2009***

- Vietnam mobile services company (VMS-Mobifone) - Zone 3, Can Tho, Vietnam.
  - Surveilled telecommunications networks to ensure optimal performance and promptly addressed incidents and disruptions.
  - Configured and maintained network devices, conducted troubleshooting, and collaborated with cross-functional teams to ensure seamless and efficient operations.
  - Proactively contributed to capacity planning, ensuring scalability and efficiency in network infrastructure.
  - Utilized strong technical skills, adaptability, and effective communication to contribute to efficient and secure OMC operations.

Professional Activities

TPC Members:

- IEEE International Wireless Communications & Mobile Computing Conference (IWCMC 2024)
- IEEE International Conference on Software Engineering and Artificial Intelligence (SEAI 2024)
- IEEE International Conference on Signal Processing and Integrated Networks (SPIN 2024)
- IEEE International Conference on Intelligent Computing and Next Generation Networks (ICNGN 2024)
- IEEE International Conference on Geoinformation Science and Communication Technology (GSCT 2025)
- International Conference on Information Society and Smart City (ISSC 2024)
- International Conference on Computer Vision and Control Systems (CVCS 2025)
- SAI Computing Conference 2025
- International Symposium on Intelligent Technology for Future Transportation (ITFT) 2024.
- Intelligent Systems Conference (IntelliSys) 2024
- Future of Information and Communication Conference (FICC) 2024, 2025

- FTC 2024 - Future Technologies Conference 2024
- International Conference on Algorithms, Network and Communication Technology (ICANCT 2024)
- International Conference in Optical Communication and Computer Engineering (ICOCCE 2024)
- International Conference on Applied Mathematics and Information Systems (AMIS 2024)
- International Conference on Digital Telecommunications (ICDT 2024)
- International Conference on Automation Engineering and Artificial Intelligence (ICAEAI 2024)
- International Conference on Communication Theory, Reliability, and Quality of Service (CTRQ 2024)
- International Conference on Artificial Intelligence and Smart Transportation Systems (AISTS 2024)
- International Conference on Advances in Human-oriented and Personalized Mechanisms, Technologies, and Services (CENTRIC 2022-2024)

Workshop Chair:

- International Conference on Pattern Recognition, Machine Vision and Intelligent Algorithms (PRMVIA) 2022-2024. Topic: Evolutionary Computation for Intelligent Communication Networks in Smart Cities.

Preferred Journals - Reviewer:

- IEEE Internet of Things Journal
- IEEE Transaction on Network and Service Management
- IEEE Access
- Elsevier Journal of Network and Computer Applications
- Springer Nature - Journal of Supercomputing
- Springer Nature - Journal of Cloud Computing
- Springer Nature - Journal of Cluster Computing
- Springer Nature - Journal of Computing
- Springer Nature - Artificial Intelligence Review Journal
- Wiley International Journal of Communication Systems
- IEC Journal of Networking and Network Applications
- Scientific Research Journal of Service Science and Management
- Hindawi Journal of Sensors
- MDPI Electronics Journal
- MDPI Mathematics Journal
- MDPI Sustainability Journal
- MDPI Journal of Marine Science and Engineering
- MDPI Artificial Intelligence (AI)
- International Journal of Vehicle Information and Communication Systems

Preferred Conferences - Reviewer:

- IEEE Global Communications Conference (GLOBECOM)
- IEEE Wireless Communications and Networking Conference (WCNC)
- IEEE Vehicular Technology Conference (VTC)
- IEEE Vehicular Power and Propulsion (VPP)
- IEEE/ACM Conference on Connected Health Applications, Systems, and Engineering Technologies (CHASE)
- International Conference on Computer Science and Application Engineering (CSAE) published in ACM
- International Conference on Pattern Recognition, Machine Vision and Intelligent Algorithms
- International Conference on Informatics Engineering & Information Science (ICIEIS)

- International Conference on Computer, Big Data and Artificial Intelligence (ICCBDAI)
- International Conference on Pattern Recognition, Machine Vision and Intelligent Algorithms (PRMVIA)
- Intelligent Systems Conference (IntelliSys)
- Future of Information and Communication Conference (FICC)
- Future Technologies Conference (FTC)

Scholarships, Awards and Achievements

***Grants*:**

- Research Intern at BitQubic funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) **Jan 2020 - Mar 2021**
- Awarded student Travel Grant from IEEE International Conference on Communications (ICC2021) **2021**
- Awarded student Travel Grant from IEEE Global Communications Conference (Globecom2021) **2021**

***Scholarships*:**

- Carleton University Departmental Scholarships **2015-2019**

***Teaching Assistant - Carleton University*:**

- SYSC5801: Advanced Topic in Computer Communications,
- SYSC5001: Discrete Simulation/Modelling (LEC),
- SYSC2310: Introduction to Digital Systems,
- SYSC2004: Object-Oriented Software Development (LEC),
- ECOR1606: Problem Solving and Computers.

***Certificates*:**

- AWS Cloud Technical Essentials - Coursera Certificate **2024**
- Foundations of Cybersecurity - Coursera Certificate **2024**
- Neural Networks and Deep Learning - Coursera Certificate **2024**
- Certificate of Mobile Technologies and Services Training Program, Centre for Excellence in Telecom Technology & Management Mumbai **2014**
- Certificate in Teaching Methodology, Can Tho University **2013**

Programming and Other Skills

- Core Competencies: Algorithm design, data structures, and problem-solving techniques.
- Programming Languages: C/C++, Python, Java, MATLAB, Shell scripting.
- Collaboration Tools: Zoom, Microsoft Teams, GitHub, Slack.
- Technical Skills: LeetCode, HackerRank (for coding challenges and algorithm practice), MS Office, LaTeX, and general technician skills.

Publications

Journals:

1. **K. Nguyen,** W. Shi and M. St-Hilaire, "Dynamic Virtual Network Embedding Leveraging Neighborhood and Preceding Mappings Information," in *IEEE Transactions on Vehicular Technology*, doi: 10.1109/TVT.2024.3443742. (Date of Publication: 15 August 2024)
2. **K. Nguyen** and C. Huang, "Toward Adaptive Joint Node and Link Mapping Algorithms for Embedding Virtual Networks: A Conciliation Strategy," in *IEEE Transactions on Network and Service Management*, vol. 19, no. 3, pp. 3323-3340, Sept. 2022, doi: 10.1109/TNSM.2022.3159479.

3. **K. Nguyen**, S. Drew, C. Huang and J. Zhou, "Parked Vehicles Task Offloading in Edge Computing," in *IEEE Access*, vol. 10, pp. 41592-41606, 2022, doi: 10.1109/ACCESS.2022.3167641.
4. **K. Nguyen** and C. Huang, "Distributed parallel genetic algorithm for online virtual network embedding," *Wiley International Journal of Communication Systems*, 23 Dec 2020, pp. e4691, doi: 10.1002/dac.4691.
5. Q. Lu, **K. Nguyen** and C. Huang, "GAONE: A Novel Approach for Online One-stage Virtual Functions Embedding", *Journal of Networking and Network Applications*, 2021 (to appear).
6. Q. Lu, **K. Nguyen** and C. Huang, Distributed parallel algorithms for online virtual network embedding applications. *Wiley International Journal of Communication Systems*, 24 Jan 2020, pp. e4325, doi: 10.1002/dac.4325.

Conferences:

1. **K. Nguyen**, W. Shi and M. St-Hilaire, "Online Resource Allocation in Internet of Vehicles Using Topology Attribute-Aware Genetic Algorithm," *2024 International Wireless Communications and Mobile Computing (IWCMC)*, Ayia Napa, Cyprus, 2024, pp. 0513-0518, doi: 10.1109/IWCMC61514.2024.10592427.
2. **Nguyen, K**., Shi, W., St-Hilaire, M. (2023). Cost-Aware Node Ranking Algorithm for Embedding Virtual Networks in Internet of Vehicles. In: Kambayashi, Y., Nguyen, N.T., Chen, SH., Dini, P., Takimoto, M. (eds) Artificial Intelligence for Communications and Networks. AICON 2022. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 477. Springer, Cham. https://doi.org/10.1007/978-3-031-29126-5_1.
3. **K. Nguyen**, W. Shi and M. St-Hilaire, "A Dynamic Vehicle-Ranking Approach for Online Virtual Network Embedding in Internet of Vehicles," 2022 *32nd International Telecommunication Networks and Applications Conference (ITNAC)*, Wellington, New Zealand, 2022, pp. 287-292, doi: 10.1109/ITNAC55475.2022.9998424.
4. **K. Nguyen**, S. Drew, C. Huang and J. Zhou, "EdgePV: Collaborative Edge Computing Framework for Task Offloading," *ICC 2021 - IEEE International Conference on Communications*, 2021, pp. 1-6, doi: 10.1109/ICC42927.2021.9500400.
5. **K. Nguyen**, Q. Lu and C. Huang, "Joint Node-Link Algorithm for Embedding Virtual Networks with Conciliation Strategy," *2021 IEEE Global Communications Conference (GLOBECOM)*, 2021, pp. 1-6, doi: 10.1109/GLOBECOM46510.2021.9685037.
6. **K. Nguyen**, Q. Lu and C. Huang, "Joint Node-Link Embedding Algorithm based on Genetic Algorithm in Virtualization Environment," *2021 IEEE 94th Vehicular Technology Conference (VTC2021-Fall), 2021*, pp. 1-5, doi: 10.1109/VTC2021-Fall52928.2021.9625390.
7. **K. Nguyen**, S. Drew, C. Huang and J. Zhou, "Collaborative Container-based Parked Vehicle Edge Computing Framework for Online Task Offloading," *2020 IEEE 9th International Conference on Cloud Networking (CloudNet)*, 2020, pp. 1-6, doi: 10.1109/CloudNet51028.2020.9335809.
8. **K. Nguyen**, Q. Lu and C. Huang, "Efficient Virtual Network Embedding with Node Ranking and Intelligent Link Mapping," *2020 IEEE 9th International Conference on Cloud Networking (CloudNet)*, 2020, pp. 1-5, doi: 10.1109/CloudNet51028.2020.9335801.
9. **K. Nguyen**, Q. Lu and C. Huang, "Rethinking Virtual Link Mapping in Network Virtualization," *2020 IEEE 92nd Vehicular Technology Conference (VTC2020-Fall)*, 2020, pp. 1-5, doi: 10.1109/VTC2020-Fall49728.2020.9348799.
10. **K. Nguyen** and C. Huang, "An Intelligent Parallel Algorithm for Online Virtual Network Embedding," *2019 International Conference on Computer, Information and Telecommunication Systems (CITS)*, Beijing, China, Aug. 2019, pp. 1-5, doi: 10.1109/CITS.2019.8862072.
11. Q. Lu, **K. Nguyen** and C. Huang, "A Novel One-stage Distributed Parallel Embedding for Virtualized Network Environment," *2020 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, Toronto, ON, Oct. 2020, pp. 395-400, doi: 10.1109/SMC42975.2020.9282829.