DUC VAN LE | CURRICULUM VITAE

Contact Information

School of Computer Science and Engineering,
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Research Interests

Networked Sensing, Computing and Learning-based Control in AIoT (AI-empowered IoT) and Cyber-Physical Systems; Applications of Machine Learning, Deep Reinforcement Learning, Multi-Agent Learning.

Education

Ph.D. **Computer Engineering**
(9/2011-12/2015) University of Ulsan, Ulsan, South Korea
Thesis: Dynamic Phenomenon Monitoring in Mobile Sensor Networks

B.Eng. (Distinction) **Electronics and Telecommunications Engineering**
(9/2006-6/2011) Le Quy Don Technical University Hanoi, Vietnam
Thesis: A study on spectrum sensing algorithms in cognitive radio networks

Experience

4/2018–present: **Research Fellow, Nanyang Technological University (NTU), Singapore**
School of Computer Science and Engineering (3/2018-present)
- Working with Prof. Rui Tan on networked sensing and learning-based control in cyber-physical systems (e.g., data centers).

HP-NTU Digital Manufacturing Corporate Lab (1/2020-present)
- Working with Prof. Rui Tan on AIoT for industrial visual sensing and quality control applications at HP factories.

1/2016–3/2018 **Research Fellow, Department of Computer Science, National University of Singapore (NUS), Singapore**
- Worked with Prof. Chen-Khong Tham on resource allocation in mobile edge computing (MEC) systems, and cooperative sensing and data processing in mobile sensor networks.

6/2016-12/2017 **Technical Consultant, Viettel R&D Institute, Viettel Group, Vietnam**
- Consulted technical engineers on design and implementation of TDMA-based MAC protocols for handset radio devices.

9/2011–12/2015 **Research Assistant, University of Ulsan, South Korea**
- Worked with Prof. Seokhoon Yoon on sensor relocation, MAC and routing protocols, and mobile data collection in wireless sensor networks.

Funding

1/2020–1/2023: **Co-PI, Development of A Novel Network Intrusion Detection System for Programmable Networking Devices**
Funded by Vietnam's National Foundation for Science and Technology Development (NAFOSTED)

Publications

Names underlined are students and researchers who worked under my mentoring for the publication.
Names dash-dotted are researchers who directly collaborated with me for the publication.
*Corresponding author. Click the paper's title to access PDF.

Peer-Reviewed Journals

16. [**IEEE IoT-J'22**] Joy Qiping Yang, **Duc Van Le***, Siyuan Zhou, Daren Ho, and Rui Tan, "Design, Deployment, and Evaluation of an Industrial AIoT System for Quality Control at HP Factories", under review for publication in IEEE Internet of Things Journal.

15. [**IEEE TMC'22**] Siyuan Zhou, **Duc Van Le***, Joy Qiping Yang, Rui Tan, and Daren Ho, "Configuration-Adaptive Wireless Visual Sensing System with Deep Reinforcement Learning", under review for publication in IEEE Transactions on Mobile Computing.

14. [**IEEE IoT-J'21**] Dao Thi-Nga, **Duc Van Le**, and Nam Xuan Tran, "A QoS-Aware Multi-Level Network Intrusion Detection System for IoT Networks", under review for publication in IEEE Internet of Things Journal.

13. [**Elsevier FGCS'22**] Yingbo Liu**, Duc Van Le***, and Rui Tan, "A Data-Assisted First-Principle Approach To Modeling Server Outlet Temperature in Air Free-Cooled Data Centers", Future Generation Computer Systems (**Scimago Journal Ranking: Q1**), vol. 129, April 2022, pp. 225-235.

12. [**IEEE T-SUSC'22**] **Duc Van Le***, Yingbo Liu, Rongrong Wang, Rui Tan and Lek Heng Ngoh, "Air Free-Cooled Tropical Data Center: Design, Evaluation, and Learned Lessons", IEEE Transactions on Sustainable Computing (**Scimago Journal Ranking: Q1**), Early Access.

11. [**ACM TCPS'22**] Rongrong Wang**, Duc Van Le**, Rui Tan and Yew-Wah Wong, "Real-Time Cooling Power Attribution for Co-Located Data Center Rooms with Distinct Temperatures and Humidifies", ACM Transactions on Cyber-Physical Systems (**Scimago Journal Ranking: Q2**), vol. 6, no. 1, January 2022.

10. [**ACM TOSN'21**] **Duc Van Le***, Rongrong Wang, Yingbo Liu, Rui Tan, Yew-Wah Wong, and Yonggang Wen, "Deep Reinforcement Learning for Tropical Air Free-Cooled Data Center Control", ACM Transactions on Sensor Networks (**Scimago Journal Ranking: Q2**), Special Issue on Computational Intelligence in Internet of Things, Vol. 17, June 2021.

9. [**Electronics'19**] Thi-Nga Dao, **Duc Van Le** and Seokhoon Yoon, "Predicting Human Location Using Correlated Movements by Members of a Social Circle", Electronics (**Scimago Journal Ranking: Q2**), Vol. 8, No. 1, January 2019.

8. [**IEEE TVT'18**] **Duc Van Le** and Chen-Khong Tham, "Quality of Service Aware Computation Offloading in an Ad-Hoc Mobile Cloud", IEEE Transactions on Vehicular Technology (**Scimago Journal Ranking: Q1**), vol. 67, no. 9, September 2018.

7. [**IEEE Sensors'16**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "Environment Learning (EL)-based Coverage Maximization with Connectivity Constraints in Mobile Sensor Networks", IEEE Sensors Journal, vol. 16, no. 10, pp. 3958-3971, May 2016 (**Scimago Journal Ranking: Q1**).

6. [**IEICE ToC'16**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "A Prediction-based Approach for Moving Phenomenon Monitoring using Mobile Sensor Nodes", IEICE Transactions on Communications (**Scimago Journal Ranking: Q3**), Vol. E99-B, No. 08, pp.1754-1762, August 2016.

5. [**Elsevier AdHoc'15**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "VirFID: A Virtual Force (VF)-based Interest-driven Moving Phenomenon Monitoring Scheme using Multiple Mobile Sensor Nodes", Elsevier Ad Hoc Networks(**Scimago Ranking: Q1**), vol. 27, pp. 112-132, April 2015.

4. [**Sensors'14**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "HiCoDG: A Hierarchical Data-Gathering Scheme Using Cooperative Multiple Mobile Elements", Sensors (**Scimago Ranking: Q2**), no. 12, 2014.

3. [**Sensors'14**] Thi-Tham Nguyen, **Duc Van Le** and Seokhoon Yoon, "Maximization of the Supportable

Number of Sensors in QoS-Aware Cluster-Based Underwater Acoustic Sensor Networks", Sensors (**Scimago Ranking: Q2**), vol. 14, no. 3, pp. 4689-4711, March 2014.

2. [**Sensors'13**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "RoCoMAR: Robots' Controllable Mobility Aided Routing and Relay Architecture for Mobile Sensor Networks", Sensors (**Scimago Ranking: Q2**), vol. 13, pp. 8695-8721, July 2013.

1. [**J-KICS'13**] **Duc Van Le**, Hoon Oh, Seokhoon Yoon, "Mobility Prediction Based Autonomous Data Link Connectivity Maintenance Using Unmanned Vehicles in a Tactical Mobile Ad-Hoc Network", The Journal of Korea Information and Communications Society, vol. 38B, no. 1, pp. 34-45, January 2013.

International Peer-Reviewed Conferences

17. [**IEEE ICPADS'21**] Jiale Chen, **Duc Van Le**, Rui Tan, and Daren Ho, "Split Convolution Neural Networks for Distributed Inference on Concurrent IoT Sensors", IEEE International Conference on Parallel and Distributed Systems (ICPADS), December 2021, China.

16. [**IEEE SECON'21**] Siyuan Zhou, **Duc Van Le**, Joy Qiping Yang, Rui Tan, and Daren Ho, "EFCam: Configuration-Adaptive Fog-Assisted Wireless Cameras with Reinforcement Learning", IEEE International Conference on Sensing, Communication and Networking, July 6-9, 2021, (Acceptance ratio: 37/140 = 26%).

15. [**IEEE SECON'21**] Joy Qiping Yang, Siyuan Zhou, **Duc Van Le**, Daren Ho, and Rui Tan, "Improving Quality Control with Industrial AIoT at HP Factories: Experiences and Learned Lessons", IEEE International Conference on Sensing, Communication and Networking, July 6-9, 2021, (Acceptance ratio: 37/140 = 26%).

14. [**ACM BuildSys'20**] **Duc Van Le**, Yingbo Liu, Rongrong Wang, Rui Tan and Lek Heng Ngoh, "Experiences and Learned Lessons from an Air Free-Cooled Tropical Data Center Testbed", ACM International Conference on Systems for Energy-Efficient Built Environments, Cities, and Transportation, November 16-19, 2020, Yokohama, Japan. (Acceptance ratio: 38/108 = 35%).

13. [**ACM BuildSys'20**] Rongrong Wang, **Duc Van Le**, Rui Tan, Yew-Wah Wong, Yonggang Wen, "Real-Time Cooling Power Attribution for Co-located Data Center Rooms with Distinct Temperatures", ACM International Conference on Systems for Energy-Efficient Built Environments, Cities, and Transportation, November 16-19, 2020, Yokohama, Japan. (Acceptance ratio: 38/108 = 35%).

12. [**EAI INISCOM**] Dao Thi-Nga, Chi Hieu Ta, and **Duc Van Le**, "An Optimal Packet Assignment Algorithm for Multi-level Network Intrusion Detection Systems", EAI International Conference on Industrial Networks and Intelligent Systems (INISCOM), August 27–28, 2020.

11. [**ACM BuildSys'19**] **Duc Van Le**, Yingbo Liu, Rongrong Wang, Rui Tan, Yew-Wah Wong, Yonggang Wen, "Control of Air Free-Cooled Data Centers in Tropics via Deep Reinforcement Learning", ACM International Conference on Systems for Energy-Efficient Built Environments, Cities, and Transportation, November 13-14, 2019, New York, USA. (Acceptance ratio: 38/128 = 29%).

10. [**ACM SenSys'18 Workshop**] **Duc Van Le**, Yingbo Liu, Rongrong Wang, Rui Tan, Lek Heng Ngoh, "A Testbed and Data Yields for Studying Data Center Energy Efficiency and Reliability", The Data: Acquisition to Analysis Workshop with ACM SenSys'18, November 4, 2018, Shenzhen, China.

9. [**IEEE INFOCOM'18 Workshop**] **Duc Van Le** and Chen-Khong Tham, "A Deep Reinforcement Learning based Offloading Scheme in Ad-hoc Mobile Clouds", IEEE INFOCOM Workshop on Integrating Edge Computing, Caching, and Offloading in Next Generation Networks, April 15-19, 2018, Honolulu, USA.

8. [**IEEE ICPADS'17**] **Duc Van Le** and Chen-Khong Tham, "Machine Learning (ML)-based Air Quality Monitoring using Vehicular Sensor Networks", IEEE International Conference on Parallel and Distributed Systems, December 2017, Shenzhen, China.

7. **[IEEE GLOBECOM'17] Duc Van Le** and Chen-Khong Tham, "An Optimization-based Approach to Offloading in Ad-Hoc Mobile Clouds", IEEE Global Communications Conference, December 2017, Singapore.

6. [**IEEE PerCom'17 Workshop**] **Duc Van Le**, Chen-Khong Tham and Yanmin Zhu, "Quality of Information (QoI)-Aware Cooperative Sensing in Vehicular Sensor Networks", IEEE PerCom Workshop on Information Quality and Quality of Service for Pervasive Computing (IQ2S), March 13-17, 2017, USA.

5. [**IEEE APCC'15**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "A Mobility Prediction (MP)-based Phenomenon Monitoring in an Unbounded Area", Aisa-Pacific Conference on Communication, October 2015.

4. [**COCOE'15**] Md Shohel Ahmed, **Duc Van Le** and Seokhoon Yoon, "A Multiple Path-Metrics based Multi-Path Routing Protocol for Providing Differentiated QoS to Various Data Traffic", 2nd International Conference on Communication and Computer Engineering, June 2015, Thailand.

3. [**IEEE ICUFN'14**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "A Novel Hierarchical Cooperative Data Gathering Architecture using Multiple Mobile Elements", Sixth International Conference on Ubiquitous and Future Networks (ICUFN), Jul. 2014, Shanghai, China.

2. [**ICTC'13**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "A Controllable Mobility (CM)-aided Routing Protocol using Mobility Prediction in MANETs", International Conference on ICT Convergence, 2013, Korea.

1. [**IEEE APCC**] **Duc Van Le**, Hoon Oh and Seokhoon Yoon, "Reinforcing Wireless Links using Controllable Mobility of Robotic Relay", 18th Aisa-Pacific Conference on Communication (APCC), Oct. 2012, Jeju, Korea.

Patents

2. [**Korean Patent'16**] Seokhoon Yoon, Chun Jeong Myong, **Duc Van Le**, "Mobile Node, Method of Managing Movement of Mobile Nodes and System Thereof", Filled in Jun 2015, Granted in Sept. 2016.

1. [**Korean Patent'14**] Seokhoon Yoon, **Duc Van Le**, "Apparatus for Management of Topology in Mobile Ad-Hoc Network and Method Thereof", Filled in October 2012, Granted in June 2014.

Technical Disclosures

1. [**HP TD'21**] Siyuan Zhou, **Duc Van Le**, Qiping Yang, Rui Tan, Kok Loon Ho, "Configuration-Adaptive Edge-Assisted Industrial Wireless Cameras with Deep Reinforcement Learning", Technical Disclosure Commons, disclosed by HP Inc. on March 26, 2021.

Technical Report

1. [**NTU TDC1**] **Duc Van Le**, Yingbo Liu, Rongrong Wang, Rui Tan, "Tropical Data Center Proof-of-Concept", Technical Report, Nanyang Technological University, 2019.

Honors and Awards

- Selected as an outstanding young scientist to attend the Heidelberg Laureate Forum (2020-2021).
- Invited to attend the Silk Road International Symposium for Distinguished Young Scholars (fully funded) in Xi'an Jiaotong University, China in 2017.
- Brain Korean 21 (BK21) scholarship program for graduate students in 2013, 2014, 2015.
- Full PhD scholarship, University of Ulsan, South Korea in 2011-2015.
- Scholarships for an excellent student of Le Quy Don Technical University, Vietnam in 2007-2011.

Memberships

- IEEE Senior Member
- EAI Distinguished Member

Professional Services

Editorship

- Topic Editor, Electronics, 2020-present
- Associate Editor, Bulletin of Electrical Engineering and Informatics, 2019-Present

TPC Member

- ACM International Conference on Cyber-Physical Systems (ICCPS 2022), Artifact Evaluation Panel
- IEEE-RIVF International Conference on Computing and Communication Technologies, 2021
- IEEE International Workshop on Advances in Fog/Edge Computing (AFEC) in ICCCN, 2020-2022.
- First International Workshop on Reinforcement Learning for Energy Management in Buildings & Cities (RLEM) in conjunction with ACM BuildSys, 2020.
- International Conference on Smart Grids, Green Communications and IT Energy-aware Technologies (ENERGY), 2020-2021.
- International Conference on Green Communications, Computing and Technologies, 2020-2021.

Conference Chairs

- Session chair for ICPADS 2017.

Reviewer (Review record verified by publons)

- Transactions/Journals: ACM TOSN, IEEE TII, IEEE TVT, IEEE TMC, IEEE TCCN, IEEE WCM, IEEE TWC, IEEE TNSM, IEEE IoT-J, IEEE Sensor Journal, IEEE Communications Letters.
- Conferences: IEEE INFOCOM (2020, 2021, 2022), IEEE ICC (2019).

Teaching and Mentoring Experiences

Nanyang Technical University

- **Teaching**: A guest lecturer for CZ/CE4171 (IoT Communications and Networking), 2/2022.
- **Research Mentoring**:
  - Graduate students and researchers: Rongrong Wang (5/2018-present), Siyuan Zhou (1/2020-present), Jiale Chen (1/2020-present), Joy Qiping Yang (1/2020-11/2021).
  - Undergraduate students: Tan Mei Xuan (1/2022-present), Sean Yong Zhi (1/2022-present), Tan Min Hao (1/2019-12/2019), Ho Min Yang (1/2019-12/2010), Tan Pei Ting (1/2019-12/2019)

National University of Singapore

- **Teaching**: A guest lecturer for EE5024 Sensor Networks, 10/2017.
- **Research Mentoring**:
  - Undergraduate students: Two FYP undergraduate students

University of Ulsan

- **Research Mentoring**:
  - Graduate students: Rumpa Dasgupta (3/2015-12/2015), Chun Jeong Myong (1/2015-12/2015)
  - Undergraduate students: Samok Kim (1/2014-12/2014), Chun Jeong Myong (1/2014-12/2014)

References

Seokhoon Yoon (PhD supervisor – 9/2001-12/2015)
Associate Professor
Department of Electrical and Computer Engineering, University of Ulsan
Email: seokhoonyoon@ulsan.ac.kr

Chen-Khong Tham (Supervisor–1/2016 3/2018)
Associate Professor, Department of Electrical and Computer Engineering, National University of Singapore
Email: eletck@nus.edu.sg

Rui Tan (Supervisor – 4/2018-present)
Associate Professor
School of Computer Science and Engineering, Nanyang Technological University
Email: tanrui@ntu.edu.sg