



Tung-Lam Nguyen

PhD Electrical Engineering



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PROFESSIONAL SKILLS

- **Simulation:** Matlab/Simulink, RT-lab, RsCad, Powerworld, PowerFactory
- **Real-simulator:** Opal-RT, RTDS, Dspace
- **Programming language:** Python, Matlab
- **Computer:** Linux, Raspberry PI
- **Other:** Latex, Docker, ns3
- Teamwork, motivation, collaboration

PROFESSIONAL EXPERIENCES

- **2022-now:** Postdoctoral Research with Hawai'i Natural Energy Institute as part of GridSTART team.

- **2021-2022:** Postdoctoral Research with Florida International University (**1 year**)

- Designing cyber-physical system in a hardware testbed
- Developing a control system for networked microgrids
- PI of an IUCRC project

- **2019 – 2020:** Postdoctoral Researcher at G2elab (Grenoble Laboratory of Electrical Engineering), France (**1 year**)

H2020 European Project: Integrating and opening existing national and regional research infrastructures of European interest (ERIGRID)

- Research on interoperability and on formalization of holistic validation approach.
- Working on the interoperability of two smart grid platforms PREDIS and PRISMES.
- Installation of Power-HIL and co-simulation experiment

- **2016 – 2019:** Ph.D. student at G2Elab (**3 years**)

Project: Agent-based distributed control and optimization in microgrids with Hardware-in-the-Loop implementation

- Proposing distributed secondary control algorithms with multiple functions for islanded microgrids.
- Formulating OPF problem for a general AC grid with matrix-based formulations and proposing a combined secondary-tertiary framework for islanded MGs with the agents run parallel finite-time consensus process and ADMM process.
- Designing a laboratory platform with controller and power hardware-in-the-loop setup including a real-time simulator, a hardware agent system and a physical communication network to validate proposed algorithms in a realistic way.

Exchange program:

- At University of Strathclyde, Glasgow, UK (**2 months**): deploying Controller and Power Hardware-in-the-loop experiment for an agent-based consensus method to control frequency in islanded microgrids. (RTDS, IEC61850 protocol, Power hardware-in-the-loop, Raspberry PI)
- At Nanyang Technological University, Singapore (**4 months**): working on distributed algorithms for hierarchical control in islanded microgrids. (Opal-RT, Raspberry PI)

Summer school: Munich, Germany (2016), Glasgow, UK (2018)

- **2010 – 2012, 2014-2016:** Lecturer at University of Science and Technology, The University of Da Nang (**5 years**)

EDUCATION

- **2019 : Ph.D.** in Electrical Engineering
Grenoble Alpes University, G2elab, France
- **2014 : Master** in Electrical Engineering
National Taiwan University of Science and Technology, Taiwan
- **2010 : Engineering Bachelor** in Electrical Engineering
University of Science and Technology, the University of Danang

PROFILE

Researcher, 4 years of experience in the field of power system, working on smart grid technology, especially in microgrids with penetration of distributed resources.

- Developing control and optimization algorithms in microgrids and multi-microgrids.
- Designing the multi-agent system and deploying python-based agents in a microcontroller cluster with physical communication system.
- Modelling and operating power system in real-time simulators and (cyber, controller) hardware-in-the-loop platform.
- Investigating co-simulation in smart grid to synchronize different kinds of simulations in different domains.
- Connecting long distance smart grid platforms for interoperability research.

Lecturer, 5 years of experience in teaching bachelor engineering students in power system major.

LANGUAGES

English:

fluent

Vietnamese

native language

PUBLICATIONS

14 journal papers (SCIE, 5 IEEE Transactions).

18 papers in proceeding of IEEE conferences.

4 deliverables in European projects.

2 book chapters.

SOCIAL ACTIVITIES

Participating in the “Green Summer” campaign in Vietnam, Festival of Cultural Asia in Taiwan.

Organizing Vietnamese Culture Festival in Taiwan.

Vice President of Vietnamese Student Association at NTUST, Taiwan

OTHERS

Interest

Sport (football, badminton, ping-pong, volleyball, tennis), Music, Tourist

PUBLICATIONS

• Journals

- [1] V. H. Nguyen, Y. Besanger, Q. T. Tran, and **T. L. Nguyen**, "On conceptual structuration and coupling methods of co-simulation frameworks in cyber-physical energy system validation," *Energies*, vol. 10, no. 12, 2017.
- [2] **T. L. Nguyen et al.**, "Multi-agent system with plug and play feature for distributed secondary control in microgrid—controller and power hardware-in-the-loop implementation," *Energies*, vol. 11, no. 12, pp. 1–10, 2018.
- [3] **T. L. Nguyen**, Q. T. Tran, and Y. Besanger, "Synchronization conditions and Real-time constraints in co-simulation and Hardware-in-the-Loop techniques for Cyber–Physical Energy System assessment," *Sustain. Energy, Grids Networks*, vol. 20, 2019.
- [4] Y. Wang, **T. L. Nguyen**, Y. Xu, Z. Li, Q. T. Tran, and R. Caire, "Cyber-Physical Design and Implementation of Distributed Event-Triggered Secondary Control in Islanded Microgrids," *IEEE Trans. Ind. Appl.*, vol. 55, no. 6, pp. 5631–5642, 2019.
- [5] Y. Wang, **T. L. Nguyen et al.**, "A Distributed Control Scheme of Microgrids in Energy Internet and Its Multi-Site Implementation," *IEEE Trans. Ind. Informatics*, vol. 3203, no. c, pp. 1–10, 2020.
- [6] Y. Wang, **T. L. Nguyen**, Y. Xu, and D. Shi, "Distributed control of heterogeneous energy storage systems in islanded microgrids: Finite-time approach and cyber-physical implementation," *Int. J. Electr. Power Energy Syst.*, vol. 119, p. 105898, 2020.
- [7] M. Aragüés Peñalba, **T. L. Nguyen, et al.**, "General form of consensus optimization for distributed OPF in HVAC-HVDC systems," *Int. J. Electr. Power Energy Syst.*
- [8] Q. T. T. Tran, E. R. Sanseverino, G. Zizzo, M. L. Di Silvestre, **T. L. Nguyen**, and Q. T. Tran, "Real-time minimization power losses by driven primary regulation in islanded microgrids," *Energies*, 2020.
- [9] Y. Wang, **T. L. Nguyen, et al.**, "Peer-to-Peer Architecture of Networked Microgrids: Multi-Layer and Multi-Agent Control Design," *IEEE Trans. Smart Grid*, 2020.
- [10] V. H. Nguyen and **T. L. Nguyen, et al.**, "Integration of SCADA services and Power-hardware-in-the-loop technique in cross-infrastructure holistic tests of cyber-physical energy systems," *IEEE Trans. Ind. Appl.*, 2020
- [11] **T. L. Nguyen, et al.**, "A Distributed Hierarchical Control Framework in Islanded Microgrids and Its Agent-based Design for Cyber-Physical Implementations," *IEEE Trans. Ind. Electron*, 2020
- [12] **T.-L. Nguyen**, Q.-T. Tran, R. Caire, Y. Wang, Y. Besanger, and N.-A. Luu, "Distributed Optimal Power Flow and the Multi-agent System for the Realization in Cyber-physical System," *Electr. Power Syst. Res.*, 2020
- [13] V. H. Nguyen, Q.T. Tran, Y. Besanger, Marc Jung, **T. L. Nguyen**, "Digital twin integrated power-hardware-in-the-loop for the assessment of distributed renewable energy resources," *Electrical Engineering*, 2021
- [14] **Nguyen, Tung Lam**, Ha Thi Nguyen, Yu Wang, Osama A. Mohammed, and Emmanouil Anagnostou. "Distributed Secondary Control in Microgrids Using Synchronous Condenser for Voltage and Frequency Support." *Energies* 15, no. 8 (2022): 2968.

• Book chapters

- [1] T. L. Nguyen et al., "Hardware-in-the-loop Assessment Method," In. T.I. Strasser, E.C.W. de Jong, M. Sosnina, "European Guide to Power System Testing", Springer
- [2] T. L. Nguyen et al., "Education and Training Needs, Methods, and Tools," In. T.I. Strasser, E.C.W. de Jong, M. Sosnina, "European Guide to Power System Testing", Springer

• Conference proceedings

- [1] **T. L. Nguyen**, Q. T. Tran, R. Caire, C. Gavriluta, and V. H. Nguyen, "Agent based distributed control of islanded microgrid-Real-time cyber-physical implementation," 2017 IEEE PES Innov. Smart Grid Technol. Conf. Eur. ISGT-Europe 2017 - Proc., vol. 2018-Janua, pp. 1–6, 2017.
- [2] V. H. Nguyen, **T. L. Nguyen et al.**, "Using power-hardware-in-the-loop experiments together with co-simulation for the holistic validation of cyber-physical energy systems," in 2017 IEEE PES Innovative Smart Grid Technologies Conference Europe, ISGT-Europe 2017 - Proceedings, 2017, vol. 2018-Janua, pp. 1–6.
- [3] Q. T. Tran, N. A. Luu, and **T. L. Nguyen**, "Optimal energy management strategies of microgrids," 2016 IEEE Symp. Ser. Comput. Intell. SSCI 2016, pp. 1–6, 2017.

- [4] V. H. Nguyen, **T. L. Nguyen** et al., "Real-Time Simulation and Hardware-in-the-Loop Approaches for Integrating Renewable Energy Sources into Smart Grids: Challenges & Actions," in IEEE PES Innovative Smart Grid Technologies ISGT Asia 2017, 2017.
- [5] **T. L. Nguyen** et al., "Systems Level Validation of a Distributed Frequency Control Algorithm," Proc. - 2018 IEEE Int. Conf. Environ. Electr. Eng. 2018 IEEE Ind. Commer. Power Syst. Eur. IEEEIC/I CPS Eur. 2018, pp. 1–6, 2018.
- [6] V. H. Nguyen, **T. L. Nguyen** et al., "Cross-infrastructure holistic experiment design for cyber-physical energy system validation," Int. Conf. Innov. Smart Grid Technol. ISGT Asia 2018, pp. 68–73, 2018.
- [7] **T. L. Nguyen**, Q. T. Tran, R. Caire, Y. Besanger, T. T. Hoang, and V. H. Nguyen, "FMI compliant approach to investigate the impact of communication to islanded microgrid secondary control," 2017 IEEE Innov. Smart Grid Technol. - Asia Smart Grid Smart Community, ISGT-Asia 2017, pp. 1–6, 2018.
- [8] **T. L. Nguyen**, R. Caire, Q. Tran, and C. Gavriluta, "Agent based distributed optimal power flow using ADMM method," in IEEE PES GTD Grand International Conference & Exposition Asia, 2019.
- [9] W. Yao, Y. Wang, Y. Xu, **T. L. Nguyen**, and X. Feng, "Distributed Multi-Functional Finite-Time Secondary Control in Cyber-Physical Microgrid," in IEEE Power and Energy Society General Meeting, 2019, vol. 2019-Augus, pp. 0–4.
- [10] **T. L. Nguyen**, Y. Wang, Q. T. Tran, R. Caire, and Y. Besanger, "Agent-based Distributed Finite-time Secondary Control of Energy Storage Systems in Microgrids - Controller Hardware-in-the-Loop Validation," Proc. 2019 IEEE PES Innov. Smart Grid Technol. Eur. ISGT-Europe 2019, pp. 1–5, 2019.
- [11] T. T. Hoang, Q. T. Tran, Y. Besanger, and **T. L. Nguyen**, "A New Directional Algorithm-based Approach to Fault Localization for Distribution Networks with High Penetration of Photovoltaic Systems," in IEEE Power and Energy Society General Meeting, 2019, vol. 2019-Augus.
- [12] V. H. Nguyen, **T. Lam Nguyen**, Q. T. Tran, Y. Besanger, and R. Caire, "Integration of SCADA services in cross-infrastructure holistic tests of cyber-physical energy systems," Proc. - 2019 IEEE Int. Conf. Environ. Electr. Eng. 2019 IEEE Ind. Commer. Power Syst. Eur. IEEEIC/I CPS Eur. 2019, no. 654113, pp. 3–7, 2019.
- [13] Y. Wang, Y. Xu, Z. Li, **T. L. Nguyen**, R. Caire, and Q. T. Tran, "Distributed event-triggered control for islanded microgrids: Cyber-physical design and implementation," Conf. Rec. - Ind. Commer. Power Syst. Tech. Conf., vol. 2019-May, pp. 1–9, 2019.
- [14] **T. L. Nguyen**, Q. T. Tran, R. Caire, N. A. Luu, and Y. Besanger, "Controller hardware-in-the-loop Implementation for Agent-based Distributed Optimal Power Flow Using ADMM on Cyber-Physical Microgrids," 2019 IEEE PES GTD Gd. Int. Conf. Expo. Asia, GTD Asia 2019, pp. 712–717, 2019.
- [15] **T. L. Nguyen**, Y. Wang, Q. T. Tran, R. Caire, Y. Xu, and Y. Besanger, "Agent-based Distributed Event-Triggered Secondary Control for Energy Storage System in Islanded Microgrids - Cyber-Physical Validation," Proc. - 2019 IEEE Int. Conf. Environ. Electr. Eng. 2019 IEEE Ind. Commer. Power Syst. Eur. IEEEIC/I CPS Eur. 2019, no. 654113, pp. 1–5, 2019.
- [16] M.-T. Le, **T.-L. Nguyen**, Q.-T. Tran, Y. Besanger, T.-T. Hoang, and V.-H. Nguyen, "A co-simulation approach for validating agent-based distributed algorithms in smart grid," in IEEE 20th Mediterranean Electrotechnical Conference (MELECON), 2020.
- [17] T.-T. Hoang, Q.-B. Duong, Q.-T. Tran, Y. Besanger, and **T.-L. Nguyen**, "A Fault Classification Method for Medium Voltage Networks with high Penetration of PV systems using Artificial Neural Networks," in IEEE PES General Meeting, 2020.