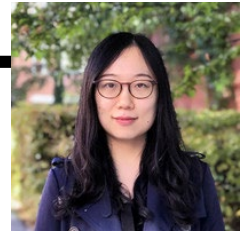


Qianwen Xu



Birth: June 20, 1992; Zhejiang, P.R.China

Affiliation: KTH Royal Institute of Technology, Stockholm, Sweden

TEL: +46 087906356 **E-mail:** qianwenx@kth.se

Website: <https://www.kth.se/profile/qianwenx/>

RESEARCH FOCUS

- Advanced control, optimization, and AI/digitalization of converter dominated grids and microgrids
- Control, optimization, stability, reliability for power converter systems (renewable energy, energy storage, hydrogen, etc)

EDUCATION

Docent, KTH Royal Institute of Technology, Sweden 2023.06

Doctor of Philosophy: Nanyang Technological University, School of EEE, Singapore 2014- 2018

Supervisor/ Co-supervisor: Prof. Peng Wang / Prof. Changyun Wen

Thesis title: Decentralized control and stability analysis of autonomous microgrids, **Excellent Doctorate Research work**

Bachelor: Tianjin University, Qiushi Honors College (Excellent Education Scheme), China 2010-2014

Awarded **National Scholarship**, Ministry of Education, China. (top 1% student)

WORK EXPERIENCE

Associate Professor, KTH Royal Institute of Technology, Sweden 2024.03- now

Assistant Professor, KTH Royal Institute of Technology, Sweden 2020.09 -2024.02

Visiting researcher, Imperial College London, UK 2020.03-2020.06

Wallenberg- NTU Presidential Postdoctoral Fellow, Nanyang Technological University, SG 2019 -2020

Postdoctoral Research Fellow: Aalborg University, Denmark 2018-2019

SUPERVISION EXPERIENCE

2021- **Main** supervisor of 6 Postdocs at KTH: Mengfan Zhang (since 2021, previously as a guest PhD student 2020-2021), Boda Li (2022), Yang Zhang (since 2023), Tianyang Zhao (2023), Dafeng Zhu (since 2024), Yihao Wan (since 2024)

2021- **Main** supervisor of 7 PhD students at KTH: Yizhou Lu (since 2021), Manuel Agredano Torres (since 2022), Fei Liu (since 2023), Xuan Jiang (since 2023), Kamil Swiderski (since 2023), Xiuchuan Sun (since 2023), Iman Ramezani (since 2024)

2020- Supervisor of 4 visiting PhD students at KTH: Guodong Guo (2021-2022), Lizhou Jiang (2022-2023), Ruixu Liu (2022-2023), Yihao Wan (2023)

2020- Supervisor of 12 MSC thesis students at KTH

2020- Supervisor of 10 BSC thesis students at KTH

TEACHING EXPERIENCE

2021- Examiner, course responsible and teacher for M.Sc course Power System Analysis, at KTH

2020- 2022 Teacher for M.Sc course Communication and Control in Electric Power Systems, at KTH

2022- Examiner, course responsible and teacher for PhD course Microgrid control, at KTH

SELECTED RESEARCH PROJECTS

Since 2020, I have led 8 national and 2 international projects as PI, and 6 as co-PI. The obtained funding grant is over 50 million SEK (my share).

Projects as PI:

1. 2022-2025 **High fidelity modeling and resilience optimization of microgrids (PI**, Swedish Research Council (VR) Starting Grant, 4 million SEK)

2. 2024-2028 **Adaptive and intelligent detection and defense for autonomous cyber-physical microgrids under cyberattacks** (PI, Wallenberg AI, Autonomous Systems and Software Program (WASP), 4 million SEK)
3. 2023- 2027 **Intelligent and multifunctional control in future power converter-dominated grids** (PI , Swedish Energy Agency, future electricity programme, 4 million SEK)
4. 2022-2025 **Customer-aware and grid-interactive energy management for smart buildings** (PI, Swedish Energy Agency, 3.3 million SEK)
5. 2022-2025 **Resilience-oriented modeling and optimization of sustainable power systems for climate neutral society** (PI, Swedish Foundation for International Cooperation in Research and Higher Education (STINT), Sweden, 600000SEK)
6. 2021-2024 **Using hydrogen electrolyzer power electronics to balance high share of wind power** (PI, Swedish Energy Agency, 3.39 million SEK)
7. 2021-2022 **Data-driven control and coordination of smart converters for sustainable power system using deep reinforcement learning** (PI, C3.ai Digital Transformation Institute (C3.ai and Microsoft), USA, collaborate with UC Berkeley, around 3.3 million SEK)
8. 2021- 2023 **Autonomous coordination and control of smart converters for sustainable power systems** (PI, Digital futures, Sweden, 2 million SEK)
9. 2021- 2024 **Intelligent power management of multi-energy hubs** (PI, KTH sustainability competence, 3M SEK)
10. 2021- 2026 **Sustainable power systems with smart converters** (PI, StandUP for Energy, Sweden, 7M SEK)

Projects as co-PI:

11. 2024-2027 **MSCA Doctoral Networks 2023 IDEAL4GREEN** (co-PI, main supervisor and PI for a PhD project with Vattenfall, 4 million SEK share)
12. 2024-2027 **Dig-IT lab Sustainable Industry** (co-PI and co-director, VINNOVA national competence center, 4 million funding share/37million SEK)
13. 2023-2026 **Sustainable mobility and logistics for post-pandemic second-tier cities** (Sweden PI , Swedish Energy Agency, EU, 3.39 million SEK/1 million euro)
14. 2023-2026 **Europe’ s Rail Flagship Project 4 - Sustainable and green rail systems** (co-PI, EU,Trafikverket, 4 million SEK funding share / Total 4.6 million euro)
15. 2023-2025 **Smart Converters for Climate-neutral Society: Artificial Intelligence-based Control and Coordination** (co-PI, Sweden’s Innovation Agency (Vinnova), 3M SEK funding share /total 7M SEK)
16. 2022-2024 **Resilient Digital Sustainable Energy Transition** (co-PI, Vice project manager, Nordic Energy Research, Swedish Energy Agency, 2million SEK funding share /total 8M SEK)

SELECTED HONORS & AWARDS

- **First Place Winner of Nordic Energy Challenge 2022**, Nordic Energy Research.
 - My project “Renewable energy-hydrogen based microgrid for sustainable Arctic communities” received the prestigious 1st place winner for Nordic Energy Challenge 2022. [link](#)
- **Royal Swedish Academy of Engineering Sciences (IVA) 100 list 2023**
 - My project "Smart microgrid for sustainable communities" is selected as one of the most promising activities in Sweden in terms of societal impact and commercialization.
- **Best Paper Award** in 2020 IEEE 11th International Symposium on Power Electronics for Distributed Generation Systems
- **Wallenberg-NTU Presidential Fellowship**, 2019
- **Alexander von Humboldt Research Fellowship**, 2019
- **Excellent Doctorate Research Work**, Nanyang Technological University, Singapore, 2019

SELECTED PROFESSIONAL ACTIVITIES

- 2021- present **Vice Chair** in IEEE Power and Energy Society & Power Electronics Society, Sweden Chapter
- 2021- present **Associate Editor** in IEEE Transactions on Smart Grid (top journal)

2022- present **Associate Editor** in IEEE Journal of Emerging and Selected Topics in Power Electronics (prestigious journal in power electronics area)

2023- present **Associate Editor** in IEEE Transactions on Transportation Electrification (top journal)

2022 **Guest Associate Editor** in IEEE Transactions on Power Electronics (top journal in power electronics area)

2019 **Distinguished Reviewer** in IEEE Transactions on Industrial Electronics (top journal in power electronics area)

2024 **Organization committee and Women in Engineering Chair**, IEEE 16th Annual Energy Conversion Congress and Exposition (ECCE), Phoenix, Arizona, USA, 2024 (top conference in power electronics)

2024 **Organization committee and Women in Engineering Chair**, IEEE 14th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), Luxembourg, 2024

2024 **Organization committee and Regional Chair**, 18th IEEE International Conference on Control & Automation (IEEE ICCA 2024), Iceland, 2024

2024 **Organization committee and Special Sessions Chair**, 19th IEEE Conference on Industrial Electronics and Applications (ICIEA 2024) , Kristiansand, Norway.2024

2023 **Organization committee and Women in Engineering Chair**, IEEE 15th Annual Energy Conversion Congress and Exposition (ECCE), Nashville, TN, USA (top conference in power electronics)

2023 **Organization committee and Women in Industrial Electronics Chair** in 49th Annual Conference of the IEEE Industrial Electronics Society (IECON 2023), Singapore (top conference in industrial electronics)

2022 **Topic Chair**, IEEE 14th Annual Energy Conversion Congress and Exposition (ECCE), Detroit, USA (top conference in power electronics)

2020 **Organization committee and Women in Industrial Electronics Chair** in 46th Annual Conference of the IEEE Industrial Electronics Society (IECON 2020), Singapore (top conference in industrial electronics)

SELECTED RELATED PUBLICATIONS (Peer-reviewed publications)

Since 2016, I published 2 book chapters, 45 top IEEE transactions papers and 20 conference papers in control and optimization of power electronic converters and systems, with 15 top IEEE transactions papers as first author (Google citation: 3121, h-index 28, i10-index 39, date: 2024.03) Link: [Google scholar](#)

Journal papers:

1. **Q. Xu**, T. Dragicevic, L. Xie and F. Blaabjerg, "Artificial Intelligence based Control Design for Reliable Virtual Synchronous Generators," *IEEE Transactions on Power Electronics*, vol. 36, no. 8, pp. 9453-9464, Aug. 2021.
2. **Q. Xu**, N. Vafamand, L. Chen, T. Dragicevic, L. Xie and F. Blaabjerg, " Review on Advanced Control Technologies for Bidirectional DC/DC Converters in DC Microgrids," *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 9, no. 2, pp. 1205-1221, April 2021
3. **Q. Xu**, C. Zhang, Z. Xu and P. Wang, " A Composite Finite-Time Controller for Decentralized Power Sharing and Stabilization of Hybrid Fuel Cell/Supercapacitor System with Constant Power Load," *IEEE Transactions on Industrial Electronics*, vol. 68, no. 2, pp. 1388-1400, Feb. 2021
4. **Q. Xu**, Y. Xu, Z. Xu, L. Xie and F. Blaabjerg, " A Hierarchically Coordinated Operation and Control Scheme for DC Microgrid Clusters under Uncertainty," *IEEE Transactions on Sustainable Energy*, vol. 12, no. 1, pp. 273-283, Jan. 2021
5. **Q. Xu**, T. Zhao, Y. Xu, Z. Xu, P. Wang and Frede Blaabjerg, " A Distributed and Robust Energy Management System for Networked Hybrid AC/DC Microgrids," *IEEE Transactions on Smart Grid*, vol. 11, no. 4, pp. 3496-3508, July 2020
6. **Q. Xu**, Y. Yan, C. Zhang, T. Dragicevic and F. Blaabjerg, " An Offset-free Composite Model Predictive Control Strategy for DC/DC Buck Converter Feeding Constant Power Loads," *IEEE Transactions on Power Electronics*, vol. 35, no. 5, pp. 5331-5342, May 2020
7. **Q. Xu**, W. Jiang, F. Blaabjerg, C. Zhang and X. Zhang, " Backstepping Control for Large Signal Stability of High Boost Ratio Interleaved Converter Interfaced DC Microgrids with Constant Power Loads," *IEEE Transactions on Power Electronics*, vol. 35, no. 5, pp. 5397-5407, May 2020.
8. **Q. Xu**, Y. Xu, C. Zhang and P. Wang, " A Robust Droop-based Autonomous Controller for Decentralized Power Sharing in DC Microgrid Considering Large Signal Stability," *IEEE Transactions on Industrial Informatics*, vol. 16, no. 3, pp. 1483-1494, March 2020
9. **Q. Xu**, C. Zhang, C. Wen and P. Wang, " A Novel Composite Nonlinear Controller for Stabilization of Constant Power Load in DC Microgrid," *IEEE Transactions on Smart Grid*, vol. 10, no. 1, pp. 752-761, Jan. 2019.

10. **Q. Xu**, Y. Xu, P. Tu, T. Zhao and P. Wang, "Systematic Reliability Modelling and Evaluation for On-board Power Systems of More Electric Aircrafts," *IEEE Transactions on Power System*. vol. 34, no. 4, pp. 3264-3273, July 2019.
11. **Q. Xu**, P. Wang, J. Chen, C. Wen, and M.Y. Lee, "A Module-based Approach for Stability Analysis of Complex More Electric Aircraft Power System," *IEEE Transactions on Transportation Electrification*, vol. 3, no. 4, pp. 901-919, Dec. 2017.
12. **Q. Xu**, J. Xiao, P. Wang, and C.Wen, "A Decentralized Control Strategy for Economic Operation of Autonomous AC, DC and Hybrid AC/DC Microgrids," *IEEE Transactions on Energy Conversion*, vol. 32, no. 4, pp. 1345-1355, Dec. 2017
13. **Q. Xu**, J. Xiao, P. Wang, X. Pan, and C. Wen, "A Decentralized Control Strategy for Autonomous Transient Power Sharing and State-of-Charge Recovery in Hybrid Energy Storage Systems," *IEEE Transactions on Sustainable Energy*, vol. 8, no. 4, pp. 1443-1452, Oct. 2017
14. **Q. Xu**, J. Xiao, X. Hu, P. Wang, and MY Lee, "A Decentralized Power Management Strategy for Hybrid Energy Storage System with Autonomous Bus Voltage Restoration and State of Charge Recovery," *IEEE Transactions on Industrial Electronics* vol. 64, no. 9, pp. 7098-7108, Sept. 2017.
15. **Q. Xu**, X. Hu, P. Wang, J. Xiao, P. Tu and C. Wen, "A Decentralized Dynamic Power Sharing Strategy for Hybrid Energy Storage System in Autonomous DC Microgrid," *IEEE Transactions on Industrial Electronics*, vol. 64, no. 7, pp. 5930-5941, July 2017
16. M. Agredano-Torres, M. Zhang, L. Söder and **Q. Xu***, "Decentralized Dynamic Power Sharing Control for Frequency Regulation Using Hybrid Hydrogen Electrolyzer Systems," in *IEEE Transactions on Sustainable Energy*, doi: 10.1109/TSTE.2024.3381491
17. M. Zhang and **Q. Xu***, "Deep Neural Network-Based Stability Region Estimation for Grid-Converter Interaction Systems," in *IEEE Transactions on Industrial Electronics*, doi: 10.1109/TIE.2024.3355525.
18. Y. Wan, **Q. Xu** and T. Dragičević, "Safety-Enhanced Self-Learning for Optimal Power Converter Control," in *IEEE Transactions on Industrial Electronics*, doi: 10.1109/TIE.2024.3363759
19. Z. Li, B. Wang, L. Xian, M. Zhang and **Q. Xu**, "Decentralized Active Disturbance Rejection Control for Hybrid Energy Storage System in DC Microgrid," in *IEEE Transactions on Industrial Electronics*, doi: 10.1109/TIE.2024.3363772.
20. B. Wang et al., "Higher Order Sliding Mode Observer Based Fast Composite Backstepping Control for HESS in DC Microgrids," in *IEEE Transactions on Sustainable Energy*, doi: 10.1109/TSTE.2024.3364653.
21. X. Wang et al., "Adaptive Voltage-Guaranteed Control of DC/DC-Buck-Converter-Interfaced DC Microgrids With Constant Power Loads," in *IEEE Transactions on Industrial Electronics*, doi: 10.1109/TIE.2024.3371003
22. M. Zhang, G. Guo, S. Magnússon, R. C. N. Pilawa-Podgurski and **Q. Xu***, "Data Driven Decentralized Control of Inverter based Renewable Energy Sources using Safe Guaranteed Multi-Agent Deep Reinforcement Learning," in *IEEE Transactions on Sustainable Energy*, doi: 10.1109/TSTE.2023.3341632
23. M. Zhang, G. Guo, T. Zhao, **Q. Xu***, DNN Assisted Projection based Deep Reinforcement Learning for Safe Control of Distribution Grids, in *IEEE Transactions on Power Systems*, 2023, doi: 10.1109/TPWRS.2023.3336614
24. M. Zhang, Y. Zhang and **Q. Xu***, "Transfer Learning based Online Impedance Identification for Module Multilevel Converters," in *IEEE Transactions on Power Electronics*, 2023, doi: 10.1109/TPEL.2023.3299194.
25. Y. You, **Q. Xu** and C. Fischione, "Hierarchical Online Game-Theoretic Framework for Real-Time Energy Trading in Smart Grid," in *IEEE Transactions on Smart Grid*, doi: 10.1109/TSG.2023.3308055.
26. B. Li, C. Wan, P. Yu, **Q. Xu** and Y. Song, "Voltage-Price Coupling in Distribution Networks," in *IEEE Transactions on Smart Grid*, doi: 10.1109/TSG.2023.3303390.
27. B. Li and **Q. Xu***, "A Machine Learning-Assisted Distributed Optimization Method for Inverter-Based Volt-VAR Control in Active Distribution Networks," in *IEEE Transactions on Power Systems*, 2023, doi: 10.1109/TPWRS.2023.3279303.
28. M. Zhang, P. I. Gómezb, **Q. Xu*** and T. Dragicevic, Review of online learning for control and diagnostics of power converters and drives, *Renewable and Sustainable Energy Reviews*, 2023, accepted, <https://doi.org/10.1016/j.rser.2023.113627>
29. G. Guo, M. Zhang, Y. Gong, **Q. Xu***, Safe multi-agent deep reinforcement learning for real-time decentralized control of inverter based renewable energy resources considering communication delay, *Applied Energy*, 2023, Volume 349, 2023
30. M. Zhang, **Q. Xu***, X. Wang, "Physics Informed Neural Network based Online Impedance Identification of Voltage Source Converters", *IEEE Transactions on Industrial Electronics*, vol. 70, no. 4, pp. 3717-3728, April 2023
31. C. Cui, T. Yang, Y. Dai, C. Zhang and **Q. Xu**, "Implementation of Transferring Reinforcement Learning for DC-DC Buck Converter Control via Duty Ratio Mapping," *IEEE Transactions on Industrial Electronics*, vol. 70, no. 6, pp. 6141-6150, June 2023
32. X. Meng, Y. Jia, **Q. Xu**, C. Ren, X. Han and P. Wang, "A Novel Intelligent Nonlinear Controller for Dual Active Bridge Converter with Constant Power Loads," *IEEE Transactions on Industrial Electronics*, vol. 70, no. 3, pp. 2887-2896, March 2023

33. S. Bhadoria et al., "Enablers for Overcurrent Capability of Silicon-Carbide-Based Power Converters: An Overview," in *IEEE Transactions on Power Electronics*, vol. 38, no. 3, pp. 3569-3589, March 2023
34. Y. Zhang, C. Zhang, R. Fan, S. Huang, Y. Yang, **Q. Xu**, Twin delayed deep deterministic policy gradient-based deep reinforcement learning for energy management of fuel cell vehicle integrating durability information of powertrain, *Energy Conversion and Management*, vol. 274, 2022
35. X. Li, C. Wen, C. Chen and **Q. Xu**, "Adaptive Resilient Secondary Control for Microgrids With Communication Faults," *IEEE Transactions on Cybernetics*, online early access, doi: 10.1109/TCYB.2021.3070820.
36. M. Zhang, **Q. Xu***, C. Zhang, L. Nordström and F. Blaabjerg, "Decentralized Coordination and Stabilization of Hybrid Energy Storage Systems in DC Microgrids," *IEEE Transactions on Smart Grid*, vol. 13, no. 3, pp. 1751-1761, May 2022
37. X. -K. Liu, C. Wen, **Q. Xu** and Y. -W. Wang, "Resilient Control and Analysis for DC Microgrid System Under DoS and Impulsive FDI Attacks," *IEEE Transactions on Smart Grid*, vol. 12, no. 5, pp. 3742-3754, Sept. 2021
38. L. Xing, **Q. Xu**, F. Guo, Z. -G. Wu and M. Liu, "Distributed Secondary Control for DC Microgrid with Event-triggered Signal Transmissions," *IEEE Transactions on Sustainable Energy*, vol. 12, no. 3, pp. 1801-1810, July 2021
39. X. Li, C. Chen, **Q. Xu** and C. Wen, "Resilience for Communication Faults in Reactive Power Sharing of Microgrids," *IEEE Transactions on Smart Grid*, vol. 12, no. 4, pp. 2788-2799, July 2021
40. X. Li, **Q. Xu** and F. Blaabjerg, "Adaptive Resilient Secondary Control for Islanded AC Microgrids With Sensor Faults," *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 9, no. 5, pp. 5239-5248, Oct. 2021.
41. L. Xing, **Q. Xu**, et al., "Robust Event-Triggered Dynamic Average Consensus Against Communication Link Failures With Application to Battery Control," *IEEE Transactions on Control of Network Systems*, vol. 7, no. 3, pp. 1559-1570, Sept. 2020
42. F. Guo, L. Wang, C. Wen, D. Zhang and **Q. Xu**, "Distributed Voltage Restoration and Current Sharing Control in Islanded DC Microgrid Systems Without Continuous Communication," *IEEE Transactions on Industrial Electronics*, vol. 67, no. 4, pp. 3043-3053, April 2020
43. Y. Gui, **Q. Xu**, F. Blaabjerg and H. Gong, "Sliding mode control with grid voltage modulated DPC for voltage source inverters under distorted grid voltage," in *CPSS Transactions on Power Electronics and Applications*, vol. 4, no. 3, pp. 244-254, Sept. 2019
44. X-K Liu, H. He, Y-W Wang, **Q. Xu** and F. Guo, "Distributed Hybrid Secondary Control for a DC Microgrid via Discrete-Time Interaction," *IEEE Transactions on Energy Conversion*, vol. 33, no. 4, pp. 1865-1875, Dec. 2018
45. F. Guo, **Q. Xu**, C. Wen, L. Wang and P. Wang, "Distributed Secondary Control for Power Allocation and Voltage Restoration in Islanded DC Microgrids," *IEEE Transactions on Sustainable Energy*, vol. 9, no. 4, pp. 1857-1869, Oct. 2018.
46. C. Dong, H. Jia, **Q. Xu**, J. Xiao, and et al, "Time-delay Stability Analysis for Hybrid Energy Storage System with Hierarchical Control in DC Microgrids," *IEEE Transactions on Smart Grid*, vol. 9, no. 6, pp. 6633-6645, Nov. 2018.
47. X. Pan, A. Ghoshal, Y. Liu, **Q. Xu**; A. K. Rathore, "Hybrid Modulation Based Bidirectional Electrolytic Capacitor-less Three-phase Inverter for Fuel Cell Vehicles: Analysis, Design, and Experimental Results," *IEEE Transactions on Power Electronics*, vol. 33, no. 5, pp. 4167-4180, May 2018
48. J. Xiao, Peng W., L. Setyawan and **Q. Xu**, "Multi-Level Energy Management System for Real-Time Scheduling of DC Microgrids With Multiple Slack Terminals," *IEEE Transactions on Energy Conversion*, vol. 31, no. 1, pp. 392-400, March 2016