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RESEARCH INTERESTS

- **Electric machine**
 - Advanced machine design: EV machines, Power generation, Robotic actuators, Multiport machines, Flux modulated machines
 - Machine optimization
 - Machine control
 - AI in electric machine design
- **Autonomous driving system**
 - Localization and mapping
 - Sensor fusion

PROFESSIONAL EXPERIENCE

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| 06/2024 - Present | Research Assistant Professor The Hong Kong Polytechnic University (PolyU) |
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EDUCATION

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| 09/2021 - 05/2024 | Ph.D. in Electrical Engineering The Hong Kong Polytechnic University (PolyU) |
| 09/2020 - 06/2021 | M.Sc. in Electrical Engineering The Hong Kong Polytechnic University (PolyU) |
| 09/2016 - 06/2020 | B.Eng. in Electrical Engineering and Automation Shanghai Maritime University (SMU) |

RESEARCH GRANTS

- PI, “Development of the High-Order Harmonic Modulation Based Multiport Machine Systems”, *PolyU Start-up Fund (PolyU P0052647)*, 08/2024-08/2026.
- PI, “Development of Compact Drum-Coil Integrated Winding Based Multi-Port Machines for Electric Propulsion and Robotic Systems”, *EEE Seed Funding Scheme (PolyU P0056361)*, 06/2025-05/2026.
- Co-I, “Development of Fault Self-Recovery Axial Direct-Drive Hub Motor for AGV”, *Innovation and Technology Fund (ITP/043/24AP)*, 12/2024-06/2026.
- Co-I, “A hybrid mechanical-thermal testing system towards an international research hub and FCE ACT (Advanced Construction Technology) Lab”, *FCE Large Equipment / Interdisciplinary Research Laboratory Fund 2024/25*, 07/2025-06/2026.

PUBLICATIONS

Journal Paper:

- [1] **M. Jiang** and S. Niu, "A High-Order Harmonic Compound Rotor Based Brushless Dual-Electrical-Port Dual-Mechanical-Port Machine," in *IEEE Transactions on Industrial Electronics*, vol. 71, no. 6, pp. 5463-5473, June 2024, doi: 10.1109/TIE.2023.3294574.
- [2] **M. Jiang** and S. Niu, "Overview of Dual Mechanical Port Machines in Transportation Electrification," in *IEEE Transactions on Transportation Electrification*, vol. 10, no. 3, pp. 4959-4977, Sept. 2024, doi: 10.1109/TTE.2023.3324948.
- [3] **M. Jiang**, S. Niu and C. C. Chan, "A High-Order-Harmonic Compound-Rotor Based Brushless Doubly-Fed Machine for Variable Speed Constant Frequency Wind Power Generation," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 13, no. 2, pp. 1492-1502, April 2025, doi: 10.1109/JESTPE.2024.3407242.
- [4] **M. Jiang**, W. Fu and S. Niu, "Design and Analysis of a Novel Dual-Airgap Dual Permanent Magnet Vernier Machine," in *IEEE Access*, vol. 9, pp. 57188-57197, 2021, doi: 10.1109/ACCESS.2021.3072918.
- [5] **M. Jiang**, K. Zhao, W. Wang, and S. Niu, "A Novel Brushless PM-Assisted DC Motor with Compound-Excited Circular Winding," *Sustainability*, vol. 15, no. 18, p. 13924, Sep. 2023, doi: 10.3390/su151813924.
- [6] **M. Jiang** and S. Niu, "Novel Mechanical Flux-Weakening Design of a Spoke-Type Permanent Magnet Generator for Stand-Alone Power Supply," *Applied Sciences*, vol. 13, no. 4, p. 2689, Feb. 2023, doi: 10.3390/app13042689.
- [7] **M. Jiang** and S. Niu, "A Novel Consequent-Pole Contra-Rotating Machine With Zero-Sequence Current Excitation," in *IEEE Transactions on Magnetics*, vol. 59, no. 11, pp. 1-5, Nov. 2023, Art no. 8101405, doi: 10.1109/TMAG.2023.3272952.
- [8] Z. Dong, **M. Jiang**, S. Niu and K. T. Chau, "Overview of Permanent Magnet Wind Power Generators," in *IEEE Transactions on Magnetics*, doi: 10.1109/TMAG.2025.3546725. (Invited paper)
- [9] Z. Dong, **M. Jiang**, S. Niu and K. T. Chau, "Mechanical Flux-Weakening Design of the Bidirectional Flux-Modulated Radial Permanent Magnet Generator for Wind Power Generation," in *IEEE Transactions on Magnetics*, doi: 10.1109/TMAG.2025.3531139.
- [10] W. Wu, **M. Jiang** and S. Niu, "Design and Analysis of a Pole-changing Machine with Multi-auxiliary-teeth Structure," in *IEEE Transactions on Magnetics*, doi: 10.1109/TMAG.2025.3540266.
- [11] W. Wu, **M. Jiang** and S. Niu, "Synergetic Optimization Based on Doubly Salient Pole-changing Machine for Torque Ripple Reduction," in *IEEE Transactions on Magnetics*, doi: 10.1109/TMAG.2025.3540271.
- [12] W. Wang, S. Niu, X. Zhao, **M. Jiang** and W. Fu, "A Novel Saturated Differential Inductance-based Position Estimation and Sensorless Startup Control of Non-salient DC Vernier Reluctance Machine," in *IEEE Transactions on Energy Conversion*, doi: 10.1109/TEC.2023.3339188.
- [13] C. Huang, L. Xiong, Y. Gong, **M. Jiang** and S. Niu, "Tangential Electromagnetic Force Array on the Vibration and Noise of Electric Axle for New Energy Vehicle," in *IEEE Access*, vol. 11, pp. 100001-100009, 2023, doi: 10.1109/ACCESS.2023.3314758.

Conference Paper:

- [1] Z. Dong, **M. Jiang** and S. Niu, "Novel Radial-Type Permanent Magnet Generators with Mechanical

Flux-Weakening Design for VSCAV Control in Wind Power Generation," *2024 IEEE International Conference on Electrical Energy Conversion Systems and Control (IEECSC)*, Shanghai, China, 2024, pp. 62-66, doi: 10.1109/IEECSC62814.2024.10913806. (Best paper)

- [2] **M. Jiang**, S. Niu and W. Wu, "Design and Analysis of a Novel Dual-Rotor Transverse Flux Permanent Magnet Machine," *IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society*, Singapore, Singapore, 2023, pp. 1-6, doi: 10.1109/IECON51785.2023.10311826.
- [3] W. Wu, S. Niu and **M. Jiang**, "Design of a Novel Dual-Rotor Permanent Magnet Multiport Machine with C-Type Stator," *IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society*, Singapore, Singapore, 2023, pp. 1-6, doi: 10.1109/IECON51785.2023.10312670.
- [4] W. Wu, S. Niu, **M. Jiang** and Y. Wang, "Flux-Weakening Capability Enhancement of a Zero-Sequence Current Excitation Based Pole-Changing Permanent Magnet Machine," *2023 26th International Conference on Electrical Machines and Systems (ICEMS)*, Zhuhai, China, 2023, pp. 2739-2743, doi: 10.1109/ICEMS59686.2023.10344530.
- [5] W. Wu, S. Niu, **M. Jiang** and Y. Wang, "Design and Optimization of a Novel Flux Reversal Permanent Magnet Machine with DC Excitation Source," *2023 26th International Conference on Electrical Machines and Systems (ICEMS)*, Zhuhai, China, 2023, pp. 2765-2769, doi: 10.1109/ICEMS59686.2023.10344545.

TEACHING

EE4003/EE4003A Electrical Machines
 EE502 Modern Protection Methods
 EE590 EE Dissertation (MSc in EE/EV)
 EE Undergraduate Final Year Project

SELECTED ACHIEVMENTS

- Gold Medals with Congratulations of the Jury, the 50th International Exhibition of Inventions Geneva (Invention: Highly Efficient Brushless Dual-rotor Contra-rotating Wind Power Generation System), 2025.
- Best Paper Award, IEEE International Conference on Electrical Energy Conversion Systems and Control (IEECSC), 2024.
- Award of Outstanding Performance in TPS Teaching, PolyU, 2022.
- Invited Talks:
 - Joint MMM-Intermag Conference, New Orleans, LA, USA, 2025.
 - The 25th Youth Salon of China Electrotechnical Society (中国电工技术学会第二十五期青年沙龙), HKUST (GZ), Guangdong, China, 2024.

SERVICES

- Session Chair / Co-Chair
 - Special Session Chair, The 20th IEEE Conference on Industrial Electronics and Applications (ICIEA 2025).
- Invited Reviewer:
 - IEEE Transactions on Industrial Electronics (TIE)
 - IEEE Transactions on Transportation Electrification (TTE)

- IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE)
- IEEE Transactions on Energy Conversion (TEC)
- IEEE Transactions on Magnetics (TMAG)
- IEEE Access