Mingyuan JIANG 江明远

Date of Birth: 29 Oct 1997
Place of Birth: Shanghai, China
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The Hong Kong Polytechnic University,
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EDUCATION BACKGROUND

09/2021 - 05/2024 **Ph.D. in Electrical Engineering**
The Hong Kong Polytechnic University (PolyU)
Thesis: Design and Optimization of Multiport Electrical Machines and Systems
Supervisor: Prof. Shuangxia NIU

09/2020 - 06/2021 **M.Sc. in Electrical Engineering**
The Hong Kong Polytechnic University (PolyU)
Thesis: Design and Analysis of High-Torque-Density Direct-Drive In-Wheel Vernier Permanent Magnet Synchronous Machine for Electric Vehicles
Supervisor: Prof. Weinong FU

09/2016 - 06/2020 **B.Eng. in Electrical Engineering and Automation**
Shanghai Maritime University (SMU)
Thesis: Design of Direct-Drive Tidal Current Generators

RESEARCH INTERESTS

- **Electric machine**
  - EV machine design: E-CVT, Direct-drive motor, In-wheel motor
  - Advanced machine design: Multiport machine, Flux modulated machine, Magnetic geared machine, BLDC machine
  - Robotic actuator design: 3-DoF actuator, linear-rotary actuator
  - Machine optimization
  - Machine control
- **Autonomous driving system**
  - Localization and mapping: GPS-IMU Fusion, SLAM
  - Sensors and hardware: Radar, LiDAR, Ultrasonic sensor, Camera, IMU
  - Perception and assessment: Object detection, Risk and uncertainty assessment, Driving style recognition
  - Connected system: Vehicle-to-everything (V2X), Vehicular cloud computing (VCC)
  - Planning and decision making: Global planning, Local planning

SELECTED AWARDS AND ACHIEVMENTS

- Award of Outstanding Performance in TPS Teaching, PolyU, 2022
- Outstanding Undergraduate Award, SMU, 2020
- 1st class scholarship, SMU, 2018
- Outstanding Student, SMU, 2018
- Scholarship of China Merchants Heavy Industry (Jiangsu) Co., Ltd, 2018

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. (**IF: 7.7**)

[2] **M. Jiang** and S. Niu*, "Overview of Dual Mechanical Port Machines in Transportation Electrification," in *IEEE Transactions on Transportation Electrification*, doi: 10.1109/TTE.2023.3324948. (**IF: 7.0**)

[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*, doi: 10.1109/JESTPE.2024.3407242. (**IF: 5.5**)

[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. (**IF: 3.9**)

[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. (**IF: 3.9**)

[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. (**IF: 2.7**)

[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. (**IF: 2.1**)

[8] 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. (**IF: 4.9**)

[9] 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. (**IF: 3.9**)

Conference Paper:

[1] **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.

[2] 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.

[3] 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.

[4] 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.

RESEARCH / PROJECT EXPERIENCE

01/2024 **Development of Next-generation In-wheel Electric Propulsion Systems for Electric Vehicles (RIF)**

- Design of the rotor-PM high-order harmonics in-wheel motor
- Verification of principle

12/2023 **Development of Flux Modulation Compound Brushless E-CVT System in Marine Propulsion (NSFC/JRS)**

- Design of novel E-CVT system for ship
- Verification of principle of the high-order-harmonic modulation
- Proposal drafting

10/2023 **Development of Novel High-power-density Integrated Rotary-Linear Motor Drives for Robotics Application (GRF)**

- Design of the novel rotary-linear motor
- Verification of principle
- Proposal drafting

07/2023 **Advanced Electric Propulsion System for Transportation Electrification (AoE)**

- Design of a new dual electromechanical port aeromotor and a dual-rotor marine motor
- Verification of principle
- Proposal drafting

04/2023 **A High-Order Harmonic Compound Rotor Based Brushless Dual-Electrical-Port Dual-Mechanical-Port Machine (Ph.D. Project)**

- Design of a new BLDDM for hybrid EV applications
- Verification of principle
- Published one paper (IEEE TIE)

10/2022 **An Integrated Wind Energy Conversion and Storage System for Uninterrupted Power Supply (GRF)**

- Design of the flywheel-integrated wind power generator
- Verification of principle

- Proposal drafting

10/2021 **A Hub-less Rim-Driven Contra-Rotating Motor Drive for Electric Ship Propulsion System (GRF)**

- Design of the contra-rotating hub-less motor for electric ship
- Verification of principle
- Proposal drafting

FIELD / TEACHING EXPERIENCE

09/2021-present **Tutor of Final Year Undergraduates / M.Sc. Candidates, PolyU**

- Advise and evaluate final year projects and final reports.

09/2021-12/2023 **Teaching assistant, PolyU (EE3002, EE4003, EE2002)**

- Complete tutorial work and act as invigilator for the final exams.
- Evaluate and score the students' assignments and exam papers.
- Award for outstanding performance in TPS teaching.

07/2019 **Internship in China Merchants Heavy Industry (Jiangsu) Co., Ltd**

- Learning the process of merchant shipbuilding.

09/2017 - 05/2018 **Instructor, SMU**

- Assisting counselor's daily work.
- Solving freshmen's questions, helping them to quickly adapt the university life.

PROFESSIONAL SERVICES

Conference Presentations and Attendances:

- International Conference on Electrical Machines and Systems (ICEMS) 2023, Zhuhai, China
- INTERMAG 2023, Sendai, Japan
- Joint MMM-INTERMAG 2022, New Orleans, LA, USA (Virtual)

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*

TECHNICAL / LANGUAGE SKILLS

Technical skills: MATLAB/Simulink, ANSYS Maxwell 2D/3D, Altium Designer, C

Language skills: **IELTS 7.5**