Mingyuan JIANG 江明远

Date of Birth: 29 Oct 1997
Place of Birth: Shanghai, China
Office: P006, G/F Anita Chan Lai Ling Building,
The Hong Kong Polytechnic University,
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Hong Kong, China, 999077.
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Personal website: jiangmy97.github.io

EDUCATION BACKGROUND

09/2021 – Present
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 design automation: GitHub project "AutoWinding_Matlab_Maxwell"
  - 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,** 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**)

[4] **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**)

[5] **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**)

[6] **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**)

[7] **M. Jiang** and S. Niu*, " A High-Order-Harmonic Compound Rotor Based Permanent Magnet Brushless Machine for Variable Speed Constant Frequency Wind Power Generation," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, submitted, 2024.

[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.

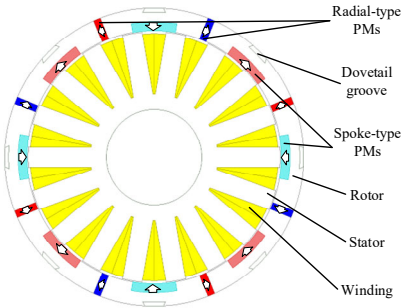
[3] W. Wu, S. Niu*, **M. Jiang** and Y. Wang, "Flux-Weakening Capability Enhancement of a Zero-Sequence Current Excitation Based Pole-Changing Permanent Magnet Machine," *2023 26th International Conference on Electrical Machines and Systems (ICEMS)*, Zhuhai, China, 2023, pp. 2739-2743, doi: 10.1109/ICEMS59686.2023.10344530.

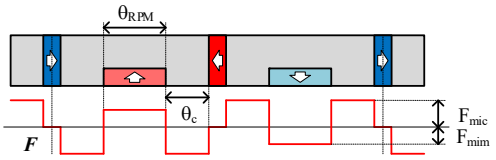
[4] W. Wu, S. Niu*, **M. Jiang** and Y. Wang, "Design and Optimization of a Novel Flux Reversal Permanent Magnet Machine with DC Excitation Source," *2023 26th International Conference on Electrical Machines and Systems (ICEMS)*, Zhuhai, China, 2023, pp. 2765-2769, doi: 10.1109/ICEMS59686.2023.10344545.

RESEARCH / PROJECT EXPERIENCE

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

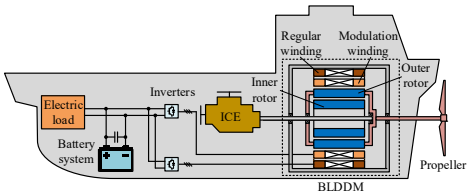
- Design of the rotor-PM high-order harmonics in-wheel motor
- Verification of principle

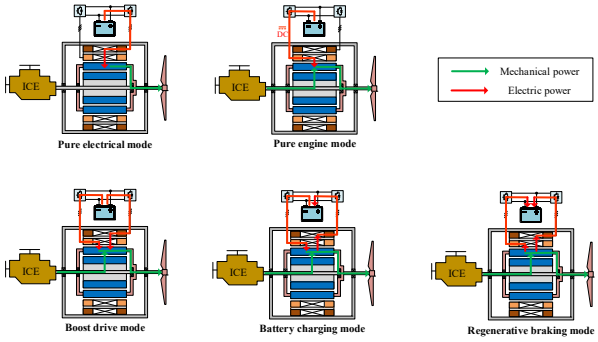




12/2023 **Development of Flux Modulation Compound Brushless E-CVT System in Marine Propulsion (NSFC/JRS)**

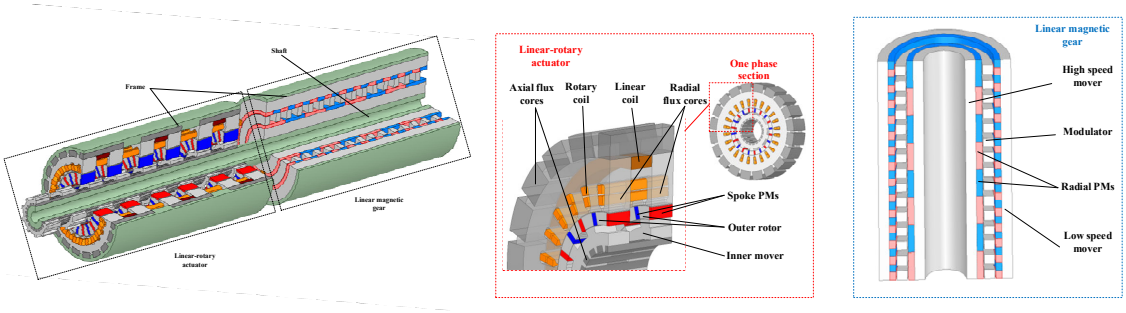
- Design of novel E-CVT system for ship
- Verification of principle of the high-order-harmonic modulation
- Proposal drafting





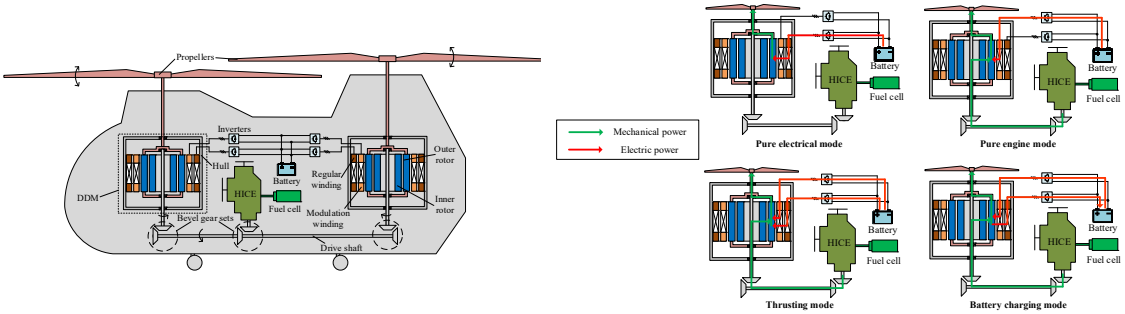
10/2023 **Development of Novel High-power-density Integrated Rotary-Linear Motor Drives for Robotics Application (GRF)**

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



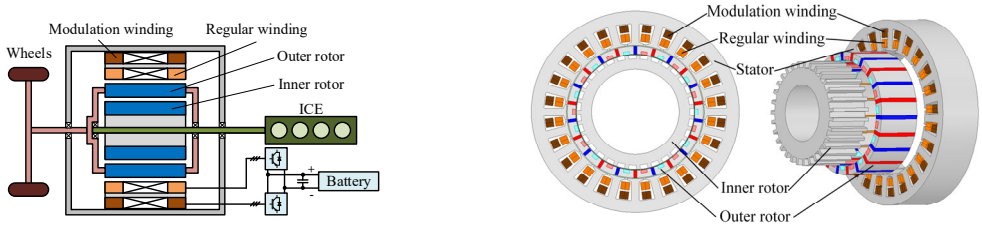
07/2023 **Advanced Electric Propulsion System for Transportation Electrification (AoE)**

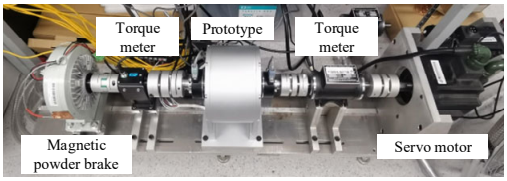
- Design of a new dual electromechanical port aeromotor and a dual-rotor marine motor
- Verification of principle
- Proposal drafting

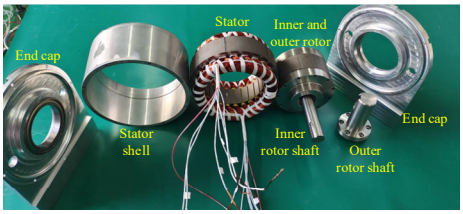


04/2023 **A High-Order Harmonic Compound Rotor Based Brushless Dual-Electrical-Port Dual-Mechanical-Port Machine (Ph.D. Project)**

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

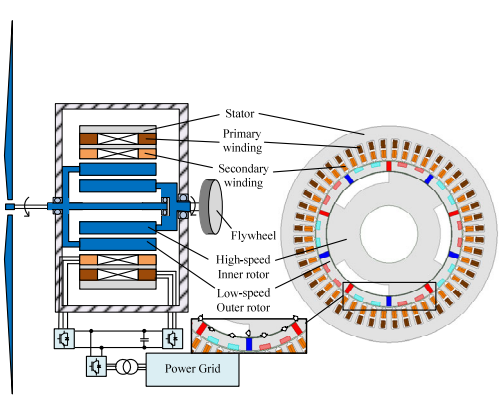


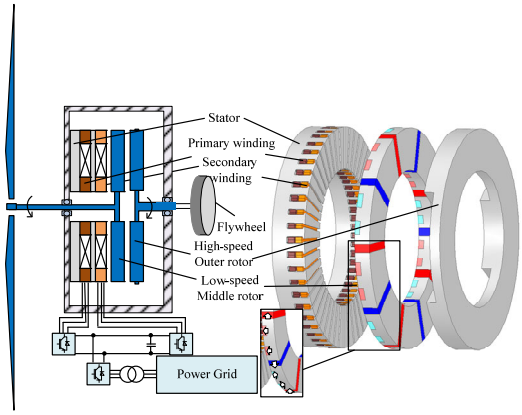




10/2022 **An Integrated Wind Energy Conversion and Storage System for Uninterrupted Power Supply (GRF)**

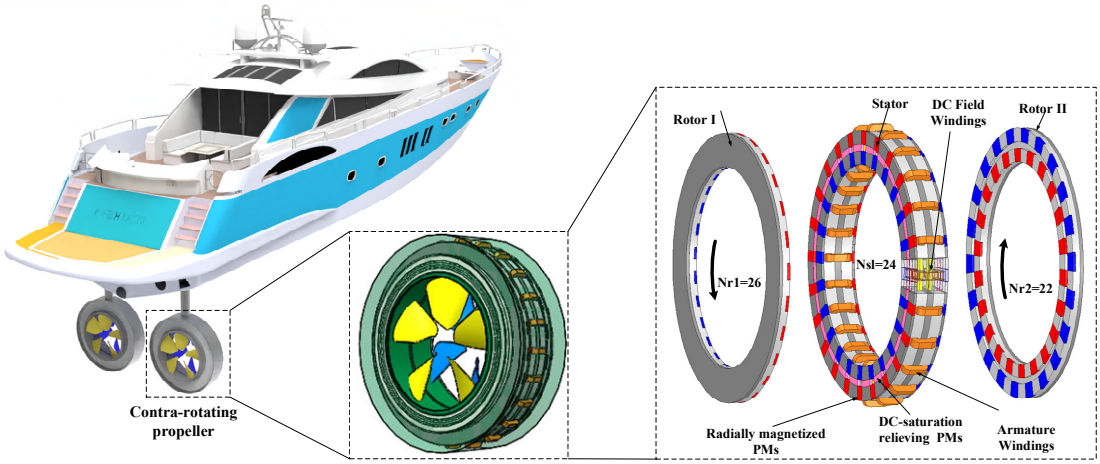
- Design of the flywheel-integrated wind power generator
- Verification of principle
- Proposal drafting





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

MISSION AND VISION

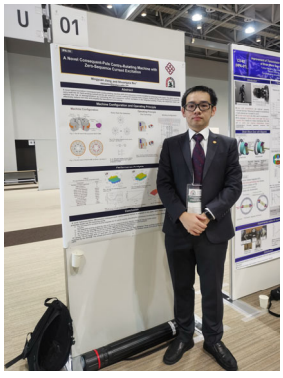
- Mission: To accelerate the advent of efficient and intelligent EV system by studying the EV machines and autonomous driving technology.
- Vision: To propose the high-torque density and energy-efficient EV machines and the reliable intelligent autonomous driving technology.

TECHNICAL / LANGUAGE SKILLS

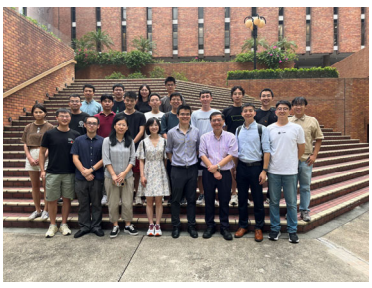
Technical skills: MATLAB/Simulink, ANSYS Maxwell 2D/3D, Altium Designer, C

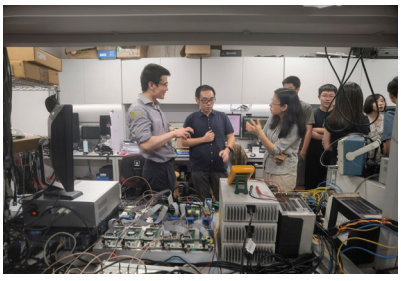
Language skills: **IELTS 7.5**

MEMORABLE PHOTOS DURING MY PHD STUDIES

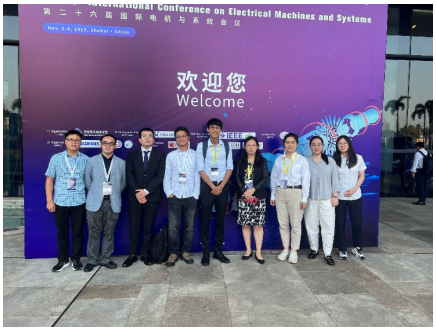


Participate Intermag 2023 conference in Sendai, Japan





With Prof. LONG Teng, Professor of Power Electronics, Department of Engineering, University of Cambridge, 2023



Participate ICEMS 2023 conference in Zhuhai, China

Participate in Launch Ceremony of PolyU RCEV, 2024