

# Dr Wenjuan Song

Address: James Watt School of Engineering, University of Glasgow, University Avenue, G12 8QQ  
Email: [wenjuan.song@glasgow.ac.uk](mailto:wenjuan.song@glasgow.ac.uk)

## **Career Progression**

- 2. 2022-now Lecturer/Assistant Professor in Electrically Powered Aircraft, University of Glasgow, UK.  
Lead Propulsion Electrification & Superconductivity group and CryoElectric Research Lab
- 5. 2019-2. 2022 Postdoctoral Research Associate, University of Bath, UK
- 10.2017-12.2018 Research Assistant, Robinson Research Institute, Victoria University of Wellington, New Zealand
- 9.2016-9.2017 Visiting Scholar, Robinson Research Institute, Victoria University of Wellington, NZ
- 10.2013-6.2015 Internship, China Electric Power Research Institute, China

## **Research Expertise and Interests**

- R&D of highly efficient and light superconducting applications for Transportation and Renewable Energy, including superconducting fault current limiters (SFCL), transformers, cables, flux pumps.
- Artificial intelligence and machine learning for superconductivity and its application, including prediction, diagnostic and prognostic, optimization, etc.
- Hydrogen-powered electric and hybrid electric aircraft system and the fault management
- Multiphysics numerical modelling for superconducting applications

## **Grants Awarded**

- EU Horizon funding, PiVOT project, 6. 2026-5. 2029, Co-I.
- EU Horizon funding, CABLEGNOSIS project, 9. 2024-8. 2027, Co-I.
- EPSRC Award, PI, 03.2026-10.2026.
- EPSRC Impact Acceleration Award, EP/X5257161/1, PI, 10. 2023-1. 2025
- EPSRC Impact Acceleration Fast Track Award, PI, 5. 2023-10. 2023
- Divisional funding in University of Glasgow, PI, 2022-2023
- University of Glasgow ECR and new academic staff School investment bid, PI, 2022.
- “Central University Doctoral Innovation Fund” from Central Ministry of Finance, China, Co-I, 1.2017-12.2018
- Fellowship grant on “International academic activities for outstanding doctoral students” Scheme from Beijing Jiaotong University, PI, 9.2016-9.2017

## **Honors & Awards**

- Being featured in the International Women in Engineering Day, INWED2025 by James Watt School of Engineering, University of Glasgow, 06.2025
- Certification of 2023 Online Peer Review Excellence Graduates from IOP Publishing, 05.2023
- Being featured as young professional in the field of cryogenics and superconductivity by Cold Facts of Cryogenic Society of America in 2022, Vol 38. No. 1, 2022
- Being an invited guest judge for Manchester Energy and Electrical Power System Symposium 2021: Power Systems in a Post-Pandemic Era (MEEPS 2021)
- Global Talent endorsed by Royal Academy of Engineering, 2022
- Being featured as talented Women Early Career Researcher for International Women’s Day, representative for the Department of EEE, University of Bath, 2021

- Best Paper Award in 2020 and 2018 IEEE International Conference on Applied Superconductivity and Electromagnetic Devices.
- Outstanding PhD Thesis Award in Beijing Jiaotong University in 2019

### **Professional Activities**

- ❖ Technical editor for IEEE TAS special issue, ASC 2022, EUCAS 2023, ASC 2024, MT 2025, EUCAS 2025
- ❖ Editor for journal Results in Engineering, 2025-2026
- ❖ Session Chair in ASC 2022, EUCAS 2023, ASC 2024, EUCAS 2025
- ❖ Early Career Editorial Board member for <Superconductivity>, 01.2022-12.2024
- ❖ Lead Guest Editor for special focus issue of Tier 1 journal <Superconductor Science and Technology>, 08.2022-12.2023
- ❖ Conference Committee member of EUCAS 2025, and IEEE 2023 International Conference on Applied Superconductivity and Electromagnetic Devices
- ❖ Reviewer for IEEE Transactions on Applied Superconductivity, IEEE Transactions on Transportation Electrification, Superconductor Science and Technology, Superconductivity, Journal of Superconductivity and Novel Magnetism, Journal of Applied Physics, Cryogenics, IEEE Access, etc.
- ❖ Panelist speaker for event “Enabling the transition to Net Zero”, co-organized by IEEE PES WiP & CIGRE NGN, 04.2023
- ❖ Completion of Advance HE Aurora Leadership Development for Women Program 2024, Scotland, Oct. 2023-April 2024.
- ❖ Chair of IEEE PES Women in Power committee, 2026-now

### **Teaching & Supervision**

- ❖ Convenor of Power Engineering 3 course
- ❖ Convenor of Year 3 and MSc course “Simulation of Engineering Systems” (300-350 students); Year 3 course “Simulation of Aero Systems”.
- ❖ MSc, MEng, and BEng project first supervisor.

### **Selected Academic Publications in last 5 years (Google scholar h-index 23, high-10 index 46)**

- 1) Song W, Yazdani-Asrami M, Melham Z, etc, Roadmap to Electrification of Transportation Systems Enabled by Superconducting Technology, Superconductor Science and Technology, 2026, accepted.
- 2) Wu Y, Fang L, Song W, Wu Y, Jiang Z, Yazdani-Asrami M. First artificial intelligence-based non-invasive framework for data-driven kink defect detection in HTS coils for power applications. Superconductivity. 2026 Feb 27:100242.
- 3) Huang Y, Yazdani-Asrami M, Song W. A Fast and Adaptive LSTM-based Surrogate Model for Predicting Limitation Performance of SFCLs in Electric Aircraft Systems. IEEE Transactions on Applied Superconductivity. 2026 Mar 13.
- 4) Bai Y, Jiang Z, Yazdani-Asrami M, Song W. Improved Equivalent Circuit Model of HTS Dynamo based on Integrating a Feature on Frequency Dependency of Critical Current. IEEE Transactions on Applied Superconductivity. 2026 Feb 24.
- 5) Bonab SA, Berg F, Song W, Colle A, Yazdani-Asrami M. AC Loss Prediction of HTS Propulsion Motors Using Convolutional Neural Network-Based Surrogate Model for System-Level Modelling of Electric Aircraft. IEEE Transactions on Applied Superconductivity. 2026 Feb 16.

- 6) Wu Y, Song W, Yazdani-Asrami M. Machine Learning Prediction for Experimental Quench Voltage of HTS Coils Using a Combined Framework With Time-Series Generative Adversarial Network and Long Short-Term Memory Techniques. *IEEE Transactions on Applied Superconductivity*. 2025 Dec 23;36(5):1-5.
- 7) Alipour Bonab S, Berg F, Song W, Colle A, Yazdani-Asrami M. Advanced deep-learning model for temporal-dependent prediction of dynamic behavior of AC losses in superconducting propulsion motors for hydrogen-powered cryo-electric aircraft. *Communications Engineering*. 2025 Dec 17.
- 8) Wu Y, Song W, Yazdani-Asrami M. Physics-guided quench detection framework for HTS coils based on augmentation of artificial quench data: a comprehensive benchmarking investigation on 75 different machine learning and dimensionality reduction techniques. *Superconductor Science and Technology*. 2025 Dec 1;38(12):125023.
- 9) Alipour Bonab S, Song W, Jiang Z, Yazdani-Asrami M. Physics-constrained deep learning framework for accurate AC loss prediction of high-temperature superconductors: impact of data scarcity and extrapolation beyond the range of experimental measurements. *Superconductor Science and Technology*. 2025 Dec 1;38(12):12LT01.
- 10) Abdolahi M, Song W, Yazdani-Asrami M. ML-Assisted Ageing Classification of XLPE Power Cables Using an Adaptive Neuro-Fuzzy Inference System. In 2025 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP) 2025 Sep 14 (pp. 888-891). IEEE.
- 11) Yazdani-Asrami M, Alipour Bonab S, WU Y, Song W. Intelligent estimation of critical current density of ReBCO superconductors exposed to irradiations for fusion energy applications: first machine learning study. *Superconductor Science and Technology*. 2025 Aug 31.
- 12) Bonab SA, Song W, Yazdani-Asrami M. Physics-informed neural network model for transient thermal analysis of superconductors. *Superconductor Science and Technology*. 2025 Aug 1;38(8):08LT01.
- 13) Alipour Bonab S, Wu Y, Song W, Yazdani-Asrami M. Intelligent estimation of critical current density of ReBCO superconductors exposed to irradiation: first machine learning study. *Superconductor Science and Technology*. 2025 Sep 1;38(9):09LT01.
- 14) Yan D, Yazdani-Asrami M, Song W. Fast-Recovery Superconducting Fault Current Limiter based on a Novel Skeleton Topology for Future Cryo-Electric Aircraft: Reclosing and Repetitive Fault Cases. *IEEE Transactions on Applied Superconductivity*. 2025 Jul 10.
- 15) Encarnacao-Gregorio F, Murta-Pina J, Vilhena N, Santos G, Yazdani-Asrami M, Song W, Oliveira R, Fernão Pires V, Granados X. Preliminary assessment of a highly flexible HTS drive for electric aircraft. *IEEE Transactions on Applied Superconductivity*. 2025 Mar 7.
- 16) Yan D, Yazdani-Asrami M, Song W. Comparative study on the impact of different EJ relations on the performance of resistive superconducting fault current limiters under high and low impedance faults in cryo-electric aircraft. *Physica C: Superconductivity and its Applications*. 2024 Oct 15;625:1354576.
- 17) Sadeghi A, Song W, Yazdani-Asrami M. Intelligent surrogate model of a high-temperature superconducting cable for reliable energy delivery: short-circuit fault performance. *Superconductor Science and Technology*. 2024 Aug 1;37(8):085025.
- 18) Yan D, Sadeghi A, Yazdani-Asrami M, Song W. Artificial-intelligence-driven model for resistive superconducting fault current limiter in future electric aircraft. *IEEE Transactions on Applied Superconductivity*. 2024 Jul 2;34(7):1-6.
- 19) Sadeghi A, Bonab SA, Song W, Yazdani-Asrami M. Short circuit analysis of a fault-tolerant

- current-limiting high temperature superconducting transformer in a power system in presence of distributed generations. *Superconductivity*. 2024 Mar 1;9:100085.
- 20) Yazdani-Asrami M, Song W, Morandi A, De Carne G, Murta-Pina J, Pronto A, Oliveira R, Grilli F, Pardo E, Parizh M, Shen B. Roadmap on Artificial Intelligence and Machine/Deep Learning Techniques for Applied Superconductivity.
  - 21) Yazdani-Asrami M, Fang L, Pei X, Song W. Smart fault detection of HTS coils using artificial intelligence techniques for large-scale superconducting electric transport applications. *Superconductor Science and Technology*. 2023 Aug 1;36(8):085021.
  - 22) Zhao X, Fang J, Jiang Z, Song W, Liu N, Gao Y, Li X, Zeng F, Xia Y, Badcock RA, Long NJ. Design, development, and testing of a 6.6 MVA HTS traction transformer for high-speed train applications. *Superconductor Science and Technology*. 2023 Aug 1;36(8):085009.
  - 23) Song H, Jiang Z, Song W. Design consideration and conductor selection of a low AC loss HTS REBCO magnet carrying high currents at 20 K and 40 K. *IEEE Transactions on Applied Superconductivity*. 2023 Mar 6;33(5):1-6.
  - 24) Wang Y, Song W, Yazdani-Asrami M, Fang J. A fast numerical modeling approach based on boundary field method for calculating AC losses in superconducting motors. *IEEE Transactions on Applied Superconductivity*. 2023 Feb 15;33(3):1-6.
  - 25) Xi J, Pei X, Song W, Niu L, Liu Y, Zeng X. Integration of superconducting fault current limiter with solid-state DC circuit breaker. *International Journal of Electrical Power & Energy Systems*. 2023 Feb 1;145:108630.
  - 26) Yazdani-Asrami M, Sadeghi A, Song W, Madureira A, Murta-Pina J, Morandi A, Parizh M. Artificial intelligence methods for applied superconductivity: material, design, manufacturing, testing, operation, and condition monitoring. *Superconductor Science and Technology*. 2022 Dec 1;35(12):123001.
  - 27) Song W, Jiang Z, Yazdani-Asrami M, Staines M, Badcock RA, Fang J. Role of flux diverters in reducing AC loss in a single-phase 6.5 MVA HTS traction transformer for Chinese high-speed train carrying high-order harmonic currents. *IEEE Access*. 2022 Jun 27;10:69650-8.
  - 28) Huber F, Song W, Zhang M, Grilli F. The TA formulation: an efficient approach to model the macroscopic electromagnetic behaviour of HTS coated conductor applications. *Superconductor Science and Technology*. 2022 Apr 1;35(4):043003.
  - 29) Song W, Pei X, Xi J, Zeng X. A novel helical superconducting fault current limiter for electric propulsion aircraft. *IEEE Transactions on Transportation Electrification*. 2020 May 28;7(1):276-86.
  - 30) Song W, Pei X, Alafnan H, Xi J, Zeng X, Yazdani-Asrami M, Xiang B, Liu Z. Experimental and simulation study of resistive helical HTS fault current limiters: Quench and recovery characteristics. *IEEE Transactions on Applied Superconductivity*. 2021 Feb 24;31(5):1-6.
  - 31) Song W, Badcock RA, Long NJ, Jiang Z. AC loss in REBCO coil windings wound with various cables: effect of current distribution among the cable strands. *IEEE Access*. 2023 Sep 15;11:102082-91.