

Rasool Peykarporsan

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🔗 Rasoolpey | 🎓 Google Scholar | 📍 Auckland, New Zealand

ABOUT ME

My journey through a B.Sc. and M.Sc. in Electrical Engineering gave me a solid foundation in power electronics, analog and digital circuit design, control theory, and power systems analysis. Pursuing a PhD at Auckland University of Technology then further strengthened that foundation, bridging high-voltage infrastructure and renewable energy integration with hands-on hardware design and embedded control. I learned to see every design from multiple angles, question assumptions, and build reliable solutions that actually stand up to rigorous testing. That process also shaped the engineer I am today, someone who picks up new topics quickly, stays self-motivated through long and uncertain projects, and genuinely enjoys working in a collaborative team where every member can grow and contribute. I am currently seeking a position where I can combine my power systems expertise with power electronics hardware design, deploying advanced optimized control algorithms to drive the performance and reliability of complex grid and energy systems to their full potential.

TECHNICAL SKILLS

Power Electronics & Hardware: Direct wireless charging, resonant & soft-switching converters (LLC, Class-D), analog & digital circuit design, PCB layout (Altium, OrCAD)

Circuit Simulation & Modelling: Cadence, ADS, LTspice, MATLAB/Simulink, circuit-level simulation, system-level impedance & loop-gain shaping

Instrumentation & Testing: Impedance analyser, Virtual Network Analyser (VNA), oscilloscopes, OPAL-RT, dSPACE, STM32F4/F7, Texas Instruments C2000, failure analysis, root cause & corrective action, DOE creation & execution

Prototyping & Validation: Hands-on experience (soldering, circuit measurement, hardware prototyping), system bring-up, characterisation, factory data collection support

Programming & Scripting: Python, MATLAB, C, C++, embedded programming, Verilog/HDL

Data & Statistical Analysis: Statistical tools (MATLAB), validation data analysis, PyTorch, Reinforcement Learning, ML-driven fault classification

EDUCATION

Auckland University of Technology (AUT) 2023 – present
PhD — Power Electronics & Power Systems Auckland, New Zealand

Shahid Beheshti University (top 5 in Iran) 2016 – 2019
M.Sc. — Power Electronics & Electric Machines Engineering Tehran, Iran

Ferdowsi University of Mashhad (top 10 in Iran) 2011 – 2015
B.Sc. — Electrical Power Engineering Mashhad, Iran

EXPERIENCE

Auckland University of Technology 2023 – present
PhD Researcher & Teaching Assistant Auckland, New Zealand

- Teaching Assistant across undergraduate and postgraduate courses: Power Systems, Power Electronics, Renewable Energy Resources.
- **Supervised 18 students:** 5 final-year theses and 13 semester research projects.
- Peer Mentor for bachelor's, master's, and PhD students (AUT Peer Mentoring Programme).

Khorasan Steel Complex 2022 – 2023
Electrical Engineer, R&D Iran

- R&D on Substation design and high-voltage infrastructure for plant expansion, and cathodic protection for pipeline and structural assets.

SELECTED PUBLICATIONS

- Intelligent Fractional-Order Cascade Control for Wind Farms (DFIG)** | *IEEE Trans. Energy Convers.* 2025
- 4DoF fractional-order cascade controller tuned by DDPG reinforcement learning; validated on a NZ wind farm.
- Low-Voltage Solid-State DC Circuit Breaker (BiTriCap)** | *IEEE Trans. Power Electron.* 2024
- Novel bidirectional thyristor-capacitor suppressor; experimentally validated at 48 VDC / 8 A with only 2 V residual overvoltage.
- Bidirectional Passive-Technique SSCB for LV Applications** | *IEEE JESTPE* 2025
- RCD-based passive SSCB: 20 μ s full interrupt, 90 μ s total fault clearing at 48 VDC / 10 A.
- Hierarchical Transformer Fault Diagnosis for Four-Leg Inverters** | *IJEPES* 2026
- Two-level Transformer-based open/short-circuit switch fault classifier; dataset generated on OPAL-RT HIL.
- Data-Driven Port-Hamiltonian Parameter ID of Synchronous Generators** | *Sensors* 2026
- Three-stage framework with differential damping decoupling; 8 parameters identified with 1.26–9.10% error.
- Model-Free Cyber-Attack Defence for Load Frequency Control** | *IET GTD* 2026
- DRL-tuned model-free observer detects and mitigates FDI attacks; validated in real time on OPAL-RT.

Full list: [Google Scholar](#) | ORCID: [0009-0006-5237-3847](#)

KEY PROJECTS

- PHPS — Port-Hamiltonian Power System Simulator** | *Python, C++* github.com/Rasoolpey/PHPS
- Transient stability simulator with built-in Lyapunov function at every simulation step; Python interface over a compiled C++ solver.
- Microgrid Hardware Testbed** | *Altium Designer, PCB* github.com/Rasoolpey/Microgrid_hardware_description
- Modular converter family (Buck, VSC, NPC, four-leg) designed end-to-end; sensor-rich boards with I2C/SPI ADCs serving as the lab's shared hardware platform.
- TCP PF–MATLAB–Python Bridge** | *Python, MATLAB, PF* github.com/Rasoolpey/TCP-PowerFactory-Matlab-Python
- Co-simulation framework synchronising DlgSILENT PowerFactory and MATLAB/Simulink with any TCP-capable client; enables ML and RL to drive live simulations.
- PIGNN — Physics-Informed GNN Digital Twin** | *Python, PyTorch* github.com/Rasoolpey/PIGNN
- GNN that encodes grid topology and physics equations; learnable components adapt to wear and operational changes.

HONORS & AWARDS

- MBIE FAN Project Doctoral Scholarship** | *Ministry of Business, Innovation and Employment (NZ)* 2023
- Awarded a fully-funded PhD scholarship as part of the MBIE FAN (Future Architecture of the Network) project.

REFERENCES

Prof. Tek Tjing Lie | *PhD Supervisor, Head of School at the Auckland University of Technology School of Engineering, Computer and Mathematical Sciences*
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Dr. Zoey Zhou | *Lecturer, Auckland University of Technology*
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