WENZHENG DONG

◇ 📧 wenzheng.dong.quantum@gmail.com ◇ ℹ️ LinkedIn ◇ 🎓 Google Scholar ◇ GitHub ◇ London, UK

PROFESSIONAL SUMMARY

Physicist & scientist with 8+ years of experience in **quantum control**, **error suppression**, and **machine learning** for quantum computers. Proven success in delivering scalable protocols for quantum devices, including IBMQ hardware. Strong background in **physics-driven modeling**, **software tooling** (PyTorch, Mathematica), and international collaboration. Also picked up broad skills including **algorithm design**, **quantitative analysis**.

EDUCATION

Ph.D. in Physics Virginia Tech, USA *2015 – 2021*

- *Thesis: Quantum Information Processing with Color Center Qubits: Theory of Initialization and Robust Control*
- Advisor: Prof. Sophia Economou
- *Highlights:* Quantum control design, color-center simulation, geometric gate protocols

TECHNICAL SKILLS

Quantum & Physics: Open Quantum Systems, Quantum Control, Noise Spectroscopy, Error Mitigation
Software & Tools: Python, PyTorch-CUDA, Mathematica, Qiskit, GitHub, Monte Carlo Simulation
Platforms: IBMQ, Custom Simulators
Additional: Neural Networks, Signal Processing, Stochastic Processing, Experimental Modeling, Team Mentorship

EXPERIENCE

Visiting Researcher 🏢 *2025/11 – Now*
Queen Mary University of London (London, UK)

- Host: Jinzhao Sun.
- Focused on quantum many-body systems, spectroscopy techniques, and quantum information sciences

Guest Scholar 🏢 *2024 – 2025*
Southern University of Science & Technology (Shenzhen, China)

- Designed independent research on noise suppression and non-Markovian error control.
- Led projects published in PRA, 1, 062605 (2025) and Quant. Sci. Tech. (2025, in press).
- Mentored junior researchers; Co-developed QEC protocols.

Postdoctoral Associate 🔬 *2021 – 2023*
Dartmouth College, Department of Physics (Hanover, NH, USA)

- Participated quantum noise benchmarking protocols on IBMQ hardware; Developed model-reduction for statistical learning of noise in NISQ hardware [see Selected Publications].
- Led collaborations with Griffith University and Johns Hopkins University.
- Published tools and invited reviews on NISQ-device control and mitigation.

Research Assistant 🎓 *2015 – 2021*
Virginia Tech, Department of Physics (Blacksburg, VA, USA)

- Designed geometric and conventional control protocols for solid-state qubits (NV diamond, SiC color-center) [See full list on Google Scholar].
- Supervised lab courses and mentored undergraduate researchers.

SELECTED PUBLICATIONS

- **W. Dong** et al., "Efficient learning and optimizing non-Gaussian correlated noise in digitally controlled qubit systems", Phys. Rev. A 111, 062605 (2025) [arXiv:2502.05408]
- Khan, **W. Dong** et al., "Multiaxis quantum noise spectroscopy robust to errors in state preparation and measurement", Phys. Rev. Applied 22, 024074 (2024) [**Editor's suggestion**]
- **W. Dong** et al., "Resource-efficient digital characterization and control of classical non-Gaussian noise", Appl. Phys. Lett. 122, 244001 (2023)
- E. Barnes, F. A. Calderon-Vargas, **W. Dong**, et al., "Dynamically corrected gates from geometric space curves", Quantum Science and Technology 7 023001 (2022)
- **W. Dong**, F. Zhuang, S. E. Economou, E. Barnes, "Doubly geometric quantum control", PRX Quantum, 2, 030333 (2021)
- **W. Dong**, F. A. Calderon-Vargas, S. E. Economou, "Precise high-fidelity electron-nuclear spin entangling gates in NV centers via hybrid dynamical decoupling sequences", New Journal of Physics, 22 (2020)
- **W. Dong**, M. W. Doherty, and S. E. Economou, "Spin polarization through intersystem crossing in the silicon vacancy of silicon carbide", Phys. Rev. B, 99, 184102 (2019)

Above are most recent. Full list at: Google Scholar

SELECTED PROJECTS & TOOLING

MIN3OS: Model-Informed Neural-Network Noise Optimization [GitHub Repository]

- Developed GPU-enabled hybrid ML framework for simulating Hamiltonian-level open-system dynamics using PyTorch
- Combined physics priors with neural network architectures to deal with noise under strong-coupling regime.

DISCO: Control-Adapted Spectroscopy for Noisy Qubits [GitHub Repository]

- Developed a quantum diagnostic and control toolkit for statistical learning of noisy dynamics.
- Demonstrated scalability to two-qubit systems (and beyond), using rigorous Monte Carlo simulations and digital-circuit "surgery" under noise.

Curvelet: Wavelet-based Decoherence Control [GitHub Repository]

- Designed signal framework using differential geometric Curves and Wavelets analysis.
- Enables visualization of dephasing dynamics and analytic modulation schemes.