Yi-Hsien Wu

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EDUCATION	B.S. in Physics, National Central University, Chungli, Taiwan 2013. Sep 2018. Jun. / GPA: 3.14
	Ph.D. in Physics, National Taiwan University, Taipei, Taiwan 2018. Sep - 2025. Jul. / GPA: 4 Transfer from master program to direct-entry doctoral program in 2020 Teaching assistant: General Physics, Introduction to Quantum Information, Quantum Computing Algorithms and Applications
EXPERIENCE	Quantum Functional System Research Group, RIKEN, Japan International Program Associate 2021. Nov 2024. Nov. Student trainee at Quantum Functional System Research Group, RIKEN under super- vision of Prof. Tarucha, Seigo.
PROJECTS	Investigation of error in CNOT gate We investigated a resonantly driven controlled-rotation based CNOT gate in an exchange- always-on two qubit system in silicon spin qubits. We found the gate is limited by a coherent controlled-phase error and develop a way to measure and mitigate this error. We use randomized benchmarking and gate-set tomography experiments to verify the improvement in gate fidelity. We then compare noise model used in simulation with experiment result and found a good match.
	High-fidelity quantum gates with pulse shaping We investigate the effect of pulse shaping on single-qubit operation fidelities for qubits in a five-qubit spin qubit devcie. We found the adiabatically pulsed Kaiser-envelope pulse increases the gate fidelity to $>99.99\%$ regime. This shaped pulse also mitigates the crosstalk driving between neighboring qubits, allowing the simultaneous operation with a single-qubit gate fidelity of $>99.99\%$ for up to three qubits.
SKILLS	Programming Languages and Frameworks python
	Spin qubit experiments Low-temperature experiments High-frequency microwave experiment Qubit control experiment Simulation of qubit control
	Languages Chinese: Native proficiency English: Professional working proficiency Japanese: Intermediate
PUBLICATIONS	Wu, YH., Camenzind, L.C., Noiri, A. et al. Hamiltonian Phase Error in Resonantly Driven CNOT Gate Above the Fault-Tolerant Threshold, npj Quantum Information

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ACTIVITIES	Poster presentation , International Workshop on Quantum Computing, Taiwan 2020. Aug. 31 - Sep. 01 Title: Effects of Different Kinds of Noise on Randomized Benchmarking Gate Fidelity
	Poster presentation , Spin Qubit 5, Switzerland 2022. Sep. 05 - Sep. 09 Title: Optimizing Two-Qubit Gates of Si/SiGe Spin Qubit using Information Provided by Gate Set Tomography
	Contributed talk , 12th Workshop on Semiconductor/Superconductor Quantum Coherence Effect and Quantum Information 2023 Sep. 27 - Sep. 29 Title: Hamiltonian Phase Error in Resonantly Driven CNOT Gate Above the Fault-Tolerant Threshold
	Poster presentation , Silicon Quantum Electronic Workshop 2023, Kyoto, Japan 2023. Oct. 31 - Nov. 02 Title: Hamiltonian Phase Error in Resonantly Driven CNOT Gate Above the Fault-Tolerant Threshold
	Poster presentation , Silicon Quantum Electronic Workshop 2024, Davos, Switzer- land 2024. Sep. 06 - Nov. 02 Title: Benchmarking Single-Qubit Gate with 99.99% Fidelity via Pulse Shaping in a Five-Qubit Spin Qubit Device
AWARDS	National Taiwan University Higher Education SPROUT Project Research Promotion Program for Direct-Entry Doctoral Degree Program Students, National Taiwan University 2020. Sep. 01 - 2023. Jul. 30 A scholarship program to support students pursuing direct-entry doctoral degrees.
	International Program Associate scholarship, RIKEN 2021. Nov. 11 - 2024. Nov. 11 Scholarship for non-Japanese PhD candidates conducting research at RIKEN through a joint graduate program with universities worldwide.
	Poster Presentation Awards for Young Researchers, Quantum Innovation 2024 Tokyo 2024. Oct. 21 Poster title: 99.99% Fidelity Quantum Gates via Pulse Shaping in Five-Qubit Spin Device