I-LI CHIU

Superconducting Quantum RF Student

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PROFESSIONAL SUMMARY

Physics undergraduate at National Central University, expected to graduate in 2026 and planning to continue graduate study in physics, focused on superconducting quantum circuits and research data workflows.

Connects theoretical assumptions, layout-level design, solver outputs, and compute infrastructure into reviewable loops that can be tested, refined, and reused.

Develops practical systems for data generation, management, analysis, and verification while using human-led, AI-assisted development to explore options faster without outsourcing judgment.

SELECTED WORK

Floating-Qubit Energy Relaxation Study

Undergraduate thesis, National Central University

Model validation | Admittance formulation | Full-wave FEM

- **Framed the physical model:** Applied an admittance-based formulation to describe floating-qubit coupling paths and make the energy-relaxation mechanism explicit enough for analytical and numerical review.
- **Cross-checked assumptions:** Compared quasi-static extraction with full-wave finite-element simulation to identify where model assumptions stayed consistent and where numerical differences could arise.

Layout-to-FEM Research Workflow

Research data generation through simulation automation

AI-assisted tooling | Simulation automation | Parameter sweep

- **Built an iteration loop:** Developed a data-generation workflow from GDSII layout to FEM simulation, connected to parametric design tooling so layout changes could become solver-ready experiments more quickly.
- **Used AI as engineering leverage:** Worked in human-led, AI-assisted loops to draft automation paths, compare implementation options, review generated code, and keep the tooling tied to the underlying physics constraints.
- **Mapped circuit parameters:** Linked lumped circuit models to Hamiltonian-level quantities around coupling strength and ZZ interaction space, enabling targeted scans for calibration-sensitive parameters.

Compute and Mesh-Refinement Operations

Simulation data analysis and verification

HPC operations | Mesh refinement | Numerical reliability

- **Ran larger solver workloads:** Used National Center for High-performance Computing (NCHC) cluster resources to produce and inspect larger simulation datasets for complex layout FEM models.
- **Balanced time and accuracy:** Tuned mesh-refinement parameters systematically so runtime, resource usage, numerical differences, and reliability could be evaluated with concrete evidence.

Research Infrastructure and Data Environment

Research data management and compute operations

NAS operations | Docker | Research systems

- **Supported lab data practices:** Helped maintain a lab-scale Synology NAS environment, improving backup habits, team access, and day-to-day reliability for research data.
- **Built personal research infrastructure:** Maintained a customized TrueNAS system integrated with Docker for research-data organization, automated backups, and flexible local compute environments.

EDUCATION

National Central University

B.S. in Physics · Expected 2026

Thesis: Study of XY-Line External Coupling Effects on Floating Qubit Energy Relaxation