CHEN HUANG

chen.huang23@imperial.ac.uk chenx820.github.io chen-huang-820x

EDUCATION

- **The Chinese University of Hong Kong (CUHK)** — **Hong Kong, CN**
  PhD in Computer Science and Engineering — *Aug. 2026 (Expected) – Jul. 2030 (Expected)*
- **Imperial College London** — **London, UK**
  M.S. in Physics with Extended Research; GPA: 76.39/100 (Distinction) — *Sep. 2023 – Sep. 2025*
- **Huazhong University of Science and Technology (HUST)** — **Wuhan, CN**
  B.S. in Physics; GPA: 89.5/100 (top 5%) — *Sep. 2018 – Jun. 2022*

RESEARCH EXPERIENCE

- **Quantum Operating System Group, Beijing Academy of Quantum Information Sciences (BAQIS)** — **Beijing, CN**
  Research Intern (Remote), supervised by Dr. Jingbo Wang — *May 2024 – Present*

  Quantum Compilation with Neutral Atoms
  - Designed a novel zoned architecture for neutral atom systems to enhance scalability and support parallel operations.
  - Developed a Python-based compiler optimizing qubit placement and routing via ASAP scheduling and nearest-neighbor algorithms, achieving a 1.38× fidelity improvement and 100× speed-up on 100-qubit circuits compared to state-of-the-art methods.
  - Built a compiler for dual-species atom arrays leveraging species-specific advantages for qubit encoding and interaction, which is essential for the implementation of quantum error correction in neutral atom platforms.
  - Explored the compilation strategies for quantum error correction in neutral atom platforms.
- **Controlled Quantum Dynamics Group, Imperial College London** — **London, UK**
  Research Assistant, supervised by Prof. Myungshik Kim & Dr. John Michniewicz — *Jun. 2024 – Sep. 2025*

  Charge Noise in Semiconductor Qubits for Quantum Computing (Master's Thesis)
  - Developed Python packages to standardize communication with experimental instruments, adopted across the lab by all members.
  - Calibrated electronic instruments to ensure the precision and accuracy of experimental measurements.
  - Characterized charge transport in silicon-based quantum dots across different device architectures and temperatures.
  - Applied machine learning to extract charge noise characteristics from large datasets and built predictive models to improve qubit fidelity.
- **Institute for Quantum Computing, Baidu Research** — **Beijing, CN**
  Research Intern, supervised by Dr. Jingbo Wang — *Mar. 2023 – Sep. 2023*

  Automated Calibration of Experimental Parameters in Trapped-Ion Systems
  - Designed a calibration framework for trapped-ion systems enabling precise measurement of phonon frequencies ω_k and Lamb-Dicke parameters η_{jk}.
  - Developed Python-based automation tools that reduced manual workload and improved parameter precision.
- **International Joint Lab on Quantum Sensing and Quantum Metrology, HUST** — **Wuhan, CN**
  Undergraduate Researcher, supervised by Prof. Dr. Jianming Cai — *Apr. 2019 – Dec. 2022*

  Nanoscale Detection of Ions Using a Spin Quantum Sensor (Bachelor's Thesis)
  - Solved the Poisson-Nernst-Planck equation in MATLAB to model electrostatic potential and ion distribution in a surface forces apparatus (SFA).
  - Developed a 2D axisymmetric model of the SFA cavity and performed finite element simulations in COMSOL.
  - Investigated ion dynamics under AC voltages in a simplified 1D model and correlated results with NV-based quantum sensing schemes.

  Measurements of Entangled Photonic Qubits
  - Conducted experiments on polarization-entangled photons generated via SPDC in BBO crystals, achieving high concurrence verified by quantum state tomography.
  - Reconstructed density matrices using QuTiP and demonstrated Bell inequality violations experimentally.

PUBLICATIONS

- **C. Huang**, X. Zhao, H. Xu, W. Zhuang, M.-J. Hu, D. E. Liu, and J. Wang, "ZAP: Zoned Architecture and Parallelizable Compiler for Field Programmable Atom Array," *arXiv preprint arXiv:2411.14037*, 2024.

PATENTS

- J. Wang, **C. Huang**, X. Zhao, H. Xu and M.-J. Hu, "Quantum computing method and quantum computing device based on partition architecture," *Chinese Patent CN120181251*, Filed 2025.
- **C. Huang** and J. Wang, "Ion trap chip parameter correction method and device, electronic equipment and medium," *Chinese Patent CN117454997*, Granted 2025.
- J. Wang and **C. Huang**, "Ion trap chip parameter determining method and device, electronic equipment and medium," *Chinese Patent CN117371547*, Granted 2024.
- J. Wang and **C. Huang**, "Ion trap chip parameter calibration method and device, electronic equipment and medium," *Chinese Patent CN117494829*, Granted 2024.

Skills

- **Experimental:** Semiconductor Quantum Device Characterization, Dilution Refrigerators, Wire Bonding
- **Programming and Software:** Python (Qiskit, QuTiP), MATLAB, LaTeX, Mathematica
- **Languages:** Mandarin (Native), English (Fluent, TOEFL 100/120)

Awards and Honors

- **China National Scholarship**, Ministry of Education of P. R. China, 2019 *(The highest honor for university students in China)*
- **Outstanding Undergraduates in Term of Academic Performance**, HUST, 2019 *(The greatest honor for undergraduates at HUST, top 1%)*
- **Yan Ji-Ci Scholarship**, Institute of Physics, Chinese Academy of Sciences, 2020
- **UCAS Scholarship**, University of Chinese Academy of Sciences, 2020
- **Mitacs Globalink Research Internship Scholarship**, Mitacs, Canada, 2021
- **Outstanding Graduate**, HUST, 2022
- **Outstanding Intern**, Institute for Quantum Computing, Baidu Research, 2023

Leadership

- **HerSTEM** **London, UK**
  Co-founder *Mar. 2025 – present*
  - Organized events supporting women in STEM, including workshops, seminars, and outreach activities.
  - Developed a website and WeChat mini-program to facilitate community engagement and discussion.
- **Innovative Base of Physics Experiments (IBPE), HUST** **Wuhan, CN**
  President *May 2019 – Jul. 2020*
  - Led the annual academic congress and coordinated seminars and workshops on *Advanced Algebra*, *Quantum Mechanics*, *Quantum Computing*, etc.
  - Mentored first-year student reading groups on *The Feynman Lectures on Physics*.
  - Founded *IBPE Review Letters* to document and share members' research findings.