Kieran Egan

kieran.fo.egan@gmail.com • kieranegan.com
scholar.google.com/citations?user=3u3bDaIAAAAJ&hl=en • github.com/Kieran-Egan

EDUCATION

M.S., Quantum Computing (Physics) Expected Dec 2027
University of Wisconsin–Madison

- Relevant coursework (Fall '26): Atomic and Quantum Physics, Qubit Tune-Up and Programming, Introduction to Quantum Computing

B.S., Computer Engineering May 2026
University of Kansas GPA: 3.49/4.0 (Cumulative) | 3.64/4.0 (Major)

- Relevant coursework: Advanced Computer Architecture (Grad.), Compilers, Operating Systems, Embedded Systems

RESEARCH EXPERIENCE

Undergraduate Researcher — KUARQ Group *Aug 2024 – May 2026*
University of Kansas Advanced, Reconfigurable, and Quantum Research Group

- Co-developed a genetic-algorithm-based quantum circuit compiler (NSGA-II with fuzzy-logic runtime adaptation) that synthesizes hardware-compatible circuits while minimizing approximation error, circuit depth, and CNOT count; achieved compilation quality competitive with industry-standard compilers (Qiskit, BQSkit) on 2-qubit unitaries. [1]
- Analyzed FPGA-accelerated quantum simulation workflows and benchmarked performance against classical simulators.
- Co-authored 2 peer-reviewed journal articles and 4 conference proceedings in quantum circuit synthesis and quantum partial differential equation solvers.
- SC25 Best Research Poster Award Finalist; QCUF 2025 Best Poster Award.

PUBLICATIONS

Journal Articles

[1] Islam, I., Jha, V., Thomas, S., **Egan, K.**, Nobel, A., Kim, S., Chaudhary, M., Ogundele, S., Kneidel, D., Phillips, B., Singh, M., El-Araby, K., Bontrager, D., & El-Araby, E. (2025). Quantum Circuit Synthesis Using Fuzzy-Logic-Assisted Genetic Algorithms. *Algorithms 2025, Special Issue on Algorithms for Quantum Computing and Quantum-Centric High-Performance Computing,* 18(4), 178, March 2025. doi: https://doi.org/10.3390/a18040178.

[2] Chaudhary, M., El-Araby, K., Nobel, A., Jha, V., Kneidel, D., Islam, I., Singh, M., Ogundele, S., Phillips, B., **Egan, K.**, Thomas, S., Bontrager, D., Kim, S., & El-Araby, E. (2025). Solving Multidimensional Partial Differential Equations Using Efficient Quantum Circuits. *Algorithms 2025,* 18(3), 176, March 2025. doi: https://doi.org/10.3390/a18030176.

Conference Proceedings

[3] Chaudhary, M., El-Araby, K., Nobel, A., Islam, I., Singh, M., Ogundele, S., **Egan, K.**, Thomas, S., Vordtriede, V., Bontrager, D., Kim, S., & El-Araby, E. (2025). A Quantum Solver for Multidimensional Partial Differential Equations: Practical Case Studies. *The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC25)*, St. Louis, MO, USA, November 2025. ★ **Best Poster Finalist**

[4] Chaudhary, M., El-Araby, K., Nobel, A., Islam, I., Singh, M., Ogundele, S., **Egan, K.**, Thomas, S., Vordtriede, V., Bontrager, D., Kim, S., & El-Araby, E. (2025). A Practical Quantum Solver for Multidimensional Partial Differential Equations. *InWorkshops of the International Conference for High Performance Computing, Networking, Storage and Analysis (SCWorkshops '25)*, November 16–21, 2025, St. Louis, MO, USA. ACM, New York, NY, USA, 10 pages. https://doi.org/10.1145/3731599.3767550.

[5] Chaudhary, M., El-Araby, K., Nobel, A., Jha, V., Islam, I., Singh, M., Ogundele, S., Egan, K., Thomas, S., Bontrager, D., Kim, S., Vordtriede, V., Hoopes, H., & El-Araby, E. (2025). Utilizing Quantum Computing for Solving Multidimensional Partial Differential Equations. *2025 Quantum Computing User Forum (QCUF 2025)*, Oak Ridge, Tennessee, USA, July 2025. ★ **Best Poster Award**

[6] Pratibha, F., Jha, V., Islam, I., Maurya, A., Chaudhary, M., Nobel, A., **Egan, K.**, Mahmud, N., & El-Araby, E. (2025). High-Level Acceleration of Quantum Simulation Frameworks on Reconfigurable Hardware. *The 62nd Design Automation Conference (DAC 2025)*, San Francisco, California, USA, June 2025.

Manuscript in Review

[7] Chaudhary, M., El-Araby, K., Bontrager, D., Nobel, A., Mohaghegh, S., **Egan, K.**, Singh, M., Campbell, T., Spry, J., Aviles, L., Mahmud, N., Reddy, P., Sadhankar, P., Shrivas, S., & El-Araby, E. (2026). A Quantum Algorithm for Multidimensional Partial Differential Equations with Practical Case Studies. Algorithms. Manuscript submitted for review (ID: algorithms-4362490).

FELLOWSHIPS & AWARDS

Outstanding Senior Award Nomination *2026*
University of Kansas

SC25 Best Research Poster Finalist *2025*

QCUF Best Poster Award *2025*

Undergraduate Research Fellowship (UGRF) *2025–2026*
University of Kansas • $2,250 over 1.5 years

SELF Engineering Leadership Fellowship *2021–2025*
University of Kansas • $28,000 over 4 years

KU Excellence Scholarship *2021–2025*
University of Kansas • *$64,000 over 4 years*

TECHNICAL SKILLS

Software & Programming:
Python, C++, C, MATLAB, Qiskit, BQSKit, Git, Docker, LaTeX

Hardware & Instrumentation:
FPGA (Xilinx), Kria KV260, SoC, embedded systems, I2C, UART, PCB design (KiCad), multimeters, oscilloscopes, power supplies

TEACHING EXPERIENCE

Supplemental Instructor — Circuits and Electronics Lab (EECS 318) *Spring 2026*
University of Kansas

- Delivered in-lab instruction and supported individual lab work in an undergraduate circuits laboratory.

PROFESSIONAL MEMBERSHIPS

IEEE Student Member *2025–Present*

Items marked ★ indicate awards.