Kevin Jofroit Joven Noriega

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Education

- **Universidad del Valle** — Cali, COL
  Electronic Engineering. — *(exp.) 24*
  Thesis: Principles of Superconducting Quantum Circuits. (draft)
  Describing the building blocks of quantum computing with superconducting circuits such as Josephson Junction, circuit quantization, transmon qubit, dispersive readout, one qubit gates, and two qubits gates.
  Advanced Courses: Applied quantum mechanics (UD), Engineering the quantum revolution (UD)
  Study Abroad: Awarded study abroad scholarship: a semester-long exchange at Austral University of Chile (Mar 19 - Jul 19)

Research Experience

- **Quantum Programming Meentee - Quantum Open Source Fundation** — Remote
  Supervisor: Prof. Satyadhyan — *Apr 23 - Jul 23*
  - **Superconducting Quantum Chip Design**: Study the impact of quantum circuits optimization based on the entanglement of the circuit and generate a NxN circuit chip design for superconducting circuits. (codes)
- **Research Assistant - University of Delaware** — Delaware, US
  Supervisor: Prof. Swati Singh — *Jun 22 - Dec 22*
  - **Open Quantum System Simulations**: Simulated an open quantum system for ultralight dark matter detection using QuTiP.
  - **Quantum Prisoner's Dilemma**: Explored the dynamics of entanglement in the quantum prisoner's dilemma through comprehensive study and analysis. (codes)
- **Research Assistant - Purdue University** — Indiana, US
  Supervisor: Prof. Sabre Kais — *Sep 21 - Feb 22*
  - **Noise on Quantum Machine Learning**: Studied the impact of decoherence time on the performance of a quantum machine learning algorithm.
  - **Web-page for Quantum Education**: Development of Quantum Computing INAN, an educational website dedicated to teaching quantum computing concepts.
- **Research Assistant - Universidad del Valle** — Cali, CO
  Supervisor: Prof. Jaime Velasco — *Jun 21 - Jun 22*
  - **Computational Framework for Solar Cell Design**: Developed a comprehensive framework for simulating solar cells using QuantumATK.
  - **Toffoli Quantum Processor**: Developed a Toffoli quantum processor to efficiently emulate quantum circuits on FPGA.
- **Patent Reviewer - Universidad del Valle** — Cali, CO
  Supervisor: Patents administrators — *Jun 19 - Dec 19*
  - **Administrative process to accept patents**: Reviewing the state of the art of all incoming patents from Universidad del Valle. Additionally, successfully oversaw the acceptance of two patents from different departments.

Projects & Outreach

- **A Practical Guide to Superconducting Qubit Experiments; C2QA**: Participated in a virtual course offered by C2QA, specializing in quantum computing concepts with a focus on superconducting circuits. (Jul '23)
- **Contribution to scQubits; UnitaryHack**: Created a comprehensive set of tutorial videos showcasing the theory of superconducting circuits using scQubits as part of the UnitaryHackathon 2023. (Jun '23). (videos)
- **IonQ Challenge; iQuHack**: Collaborated as a member of a 5-person team to participate in the iQuHACK (MIT) IonQ Challenge, successfully designed a quantum convolutional neural network. (Feb '23). (codes)
- **QSciTech Virtual Summer School; QSciTech**: Attended QSciTech's virtual Summer School on Quantum Computing, gaining knowledge in quantum computing and a understanding of the quantum technology ecosystem. (Jul '21)
- **STAQ Quantum Ideas Virtual Summer School; Duke University**: Learning concepts in quantum computing, QIS and the different architectures. (Jun '21)
- **Quantum Computation and Quantum Sensing Summer school; Galileo Galilei Institute**: Acquiring valuable knowledge and skills in quantum sensing and circuit QED. (Jun '21)

Awards

- **ICTP - Quantinuum Quantum Hackathon First Place**: Awarded first place at the ICTP-Quantinuum Hackathon for designing a Filtering-Variational Quantum Eigensolver (F-VQE), which applied innovative noise models and scalability approaches to solve complex optimization problems. (Apr '23). (codes)
- **Challenge QHack; Xanadu**: Achieved the second place in the QHack Visualization Challenge and successfully designed an innovative approach to visualize the probabilities outcomes of a quantum circuit. (Feb '23). (codes)

Fellowships and Distinctions

- **Delaware Fellowships**: Awarded a research internship at the University of Delaware, being selected among the top 20 of applicants in the country (Feb '22)
- **Nexo Global Fellowships**: Awarded for a research scholarship at Purdue University, being selected top 1 among 20 applicants in the Valle del Cauca department. (Apr '21)
- **Alianza del Pacifico Fellowships**: Admitted in a highly selective semester exchange program at the University Austral Chile, being selected among the top 80 of applicants in the country. (Feb '19)
- **DAAD group Fellowships**: Conducted a visit trip to various universities in Germany to research graduate programs and promote Colombian and Universidad del Valle culture. (Aug '18)
- **Top 5 academic marks at University**: Recognized for achieving the top 5 academic marks in my major for semesters 1, 3, 4, and 5, with 3, 1, 1, and 1 best marks, respectively, among my cohort at the university.

Talks

- **Quantum Programming using Qiskit**: Delivered a presentation at the University of Delaware to an audience of over 20 individuals, demonstrating how to program on quantum computers and explaining the intricacies of the teleportation circuit using Qiskit. (Nov '22).
- **Introduction to Qiskit Metal**: Presented at the Qiskit Fall Fest - Mexico to a virtual audience of over 40 individuals, providing insights on quantum hardware and delivering an introduction to Qiskit Metal. (Oct '22). (video)
- **Colloquium: Quantum Computing**: Delivered an introductory presentation on quantum computing and its applications at the University of Atlantico. (Aug '21)

Volunteer Experience

- **Qiskit Advocate; IBM**: Actively promoted quantum computing awareness as a Qiskit advocate, delivering presentations, contributing content, and collaborating with peers to inspire and educate.
- **Full stack Quantum Computation**: Co-founder of a global NPO dedicated to promoting open-source learning materials for quantum information science.
- **Student Committee; IEEE Quantum Education**: Contributed to the IEEE student committee for quantum education as a member of the registration desk team at the IEEE Quantum Week event. (Sep '22)

Skills Summary

- **Programming Languages**: Python, C, Java, Matlab, VHDL, Bash, Julia
- **Packages**: Qiskit, Numpy, Pennylane, TKET, Pandas, QuTiP
- **Hardware**: oscilloscope, network analyzer, Arduino, FPGA
- **Tools**: GitHub, MySQL, Inkscape, Latex, Linux