

# Jussi Ritvas

Software Engineer – Quantum Computing

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## Professional Summary

Software Engineer specializing in quantum computing at IQM Quantum Computers. Experienced in full-stack quantum computer development, including circuit to pulse transpilation, software performance benchmarking and distributed computing. Background in computer science with focus on concurrency, data structures and parallel computing.

## Professional Experience

- 2024–present **Software Engineer, IQM Quantum Computers**, Espoo, Finland
- Led and contributed to a major refactoring of the intermediate pulse representation, improving scalability and enabling device-agnostic support across multiple superconducting quantum hardware platforms.
  - Exposed new hardware capabilities through stable, user-facing APIs, bridging low-level device features with higher-level quantum software stacks.
  - Re-architected performance-critical components to use asynchronous and concurrent execution models, significantly improving throughput and reducing end-to-end execution latency.
  - Collaborated closely with hardware, calibration, and research teams to translate experimental requirements into robust, production-ready software systems.
- 2022–2024 **Consultant, Netlight Consulting**, Helsinki, Finland
- Interviewed and independently selected to work with IQM Quantum Computers, joining their quantum software team as a software engineer.
  - Strengthened skills in technical communication, product-minded engineering, and informal team leadership through Netlight's consulting environment.
- 2020–2022 **Co-Founder, Clozeta**, Helsinki, Finland
- Co-founded an online clothing rental platform offering subscription-based and one-time rentals to consumers.
  - Served as the sole engineer on the founding team, designing and developing the entire web product end-to-end, including backend services, frontend application, and deployment infrastructure.
  - Built and operated production systems independently, taking responsibility for architecture, implementation, reliability, and iteration based on user needs.
- 2019–2020 & 2021–2022 **Specialist SoC SW, Nokia**, Espoo, Finland
- Worked as a trainee and later as a permanent specialist in the SoC R&D department
  - My work consisted mainly of programming ASIPs that were able to handle FFT & iFFT efficiently and implementing a state machine based on the properties of the signals.

## Education

- 2020–Present **Master's Degree in Computer Science, Aalto University**, Espoo, Finland
- Currently writing my thesis on distributed quantum computing.
  - Degree pursued alongside full-time industry work in quantum software engineering.
- 2017–2020 **Bachelor's Degree in Computer Science, Aalto University**, Espoo, Finland
- Bachelor's thesis: "Odotuksettomat tietorakenteet" (Wait-free Data Structures, 2019)
  - Explored lock-free and wait-free concurrent data structures: wait-free queues, counters, and related concurrency primitives.

## Skills

Programming & Tools	Python (primary), Golang, Javascript, Asynchronous programming, Parallel Computing, C++, C, Docker
Quantum Computing	Full-stack quantum software, Distributed Quantum Computing
Concurrency	Lock-free / wait-free data structures, multi-processing / multi-threading, Distributed Systems

## Contributed Publications

- 2025 Above 99.9% Fidelity Single-Qubit Gates, Two-Qubit Gates, and Readout in a Single Superconducting Quantum Device (arXiv:2508.16437, 5+ citations)
- 2025 A Superconducting Qubit-Resonator Quantum Processor with Effective All-to-All Connectivity (arXiv:2503.10903, 6+ citations)
- 2024 Technology and Performance Benchmarks of IQM's 20-Qubit Quantum Computer (arXiv:2408.12433, 30+ citations)