Siddhant Singh, Ph.D.

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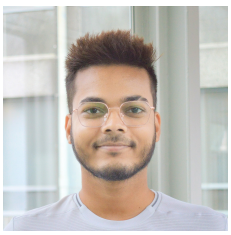

Industry experience

Sep 2025 – Present

QuiX Quantum B.V., Enschede, The Netherlands
Quantum Error Correction Scientist: *Investigating and proposing new quantum error correction (QEC) codes for photonic architectures in measurement-based quantum computation (MBQC) framework. Leading the development of realistic hardware simulations for QEC to build the scalability roadmap. Building dynamic and adaptive protocols for MBQC in realistic experimental settings.*

Apr 2021 – Jun 2021

BosonQ Psi, New York, United States
Quantum algorithms developer: *Developed and implemented (qiskit) quantum algorithms for solving coupled linear systems in computational fluid dynamics (CFD) and estimated resource costs. Supervised a team of 3 interns to achieve the first implementation of CFD models.*
Direct report to: *Abhishek Chopra (CEO) and Rut Lineswala (CTO)*

Educational affiliations

Aug 2021 – Jul 2025

Ph.D., QuTech, Technische Universiteit (TU) Delft, Delft, The Netherlands
Quantum Error Correction for Modular Architectures
Supervisor(s): *David Elkouss, Johannes Borregaard, and Barbara Terhal*

Jul 2020 – Jun 2021

Theoretical Quantum Physics Laboratory, RIKEN, Saitama, Japan
Research Assistant, *under chief scientist Franco Nori*

Jul 2015 – Jul 2020

B.S. & M.S. Physics, Indian Institute of Technology (IIT) Kharagpur, India
MSc Thesis: *A switching approach for perfect state transfer over a scalable and routing enabled network architecture with superconducting qubits [link]*

Publications and preprints

- **S. Singh**, F. D. Ronde, S. Feld, S. Wong, D. Elkouss
  Fault-tolerant designs and logical operations of modular quantum error-detection codes under realistic noise [Manuscript under preparation]

- **S. Singh**, R. Kashiwagi, K. Tanji, W. Roga, D. Bhatti, M. Takeoka, D. Elkouss
  Fault-tolerant modular quantum computing with surface codes using single-shot emission-based hardware
  arXiv preprint arXiv:2601.07241 [arXiv]*[Under review in Physical Review Applied]*

- **S. Singh**, F. Gu, S. de Bone, E. Villaseñor, D. Elkouss, J. Borregaard
  Modular Architectures and Entanglement Schemes for Error-Corrected Distributed Quantum Computation
  npj Quantum Information volume 12, Article number: 3 (2026) [link][arXiv]

- **S. Singh**, B. Adhikari, S. Dutta, D. Zueco
  Perfect state transfer on hypercubes and its implementation using superconducting qubits
  Phys. Rev. A **102**, 062609 (2020) [link] [arXiv]

- **S. Singh**, S. Srivastava, P. Panigrahi
  Quantum secret sharing for a multipartite system under energy dissipation
  arXiv preprint arXiv:1712.10219 [arXiv]

Relevant undergraduate projects

- **State transfer in chiral superconducting networks with waveguide-QED** | RIKEN, Tokyo
- **Quantum error correction on scalable molecular architecture** | U. Valencia, Spain
- **Stabilization of 866 nm laser with Pound-Drever-Hall (PDH) method for quantum manipulation of Ca+ ion in Paul trap** *[Experimental work] [link]* | Universitat Basel, Switzerland
- **Analysis of quantum decoherence in optomechanical systems** | University of Malaysia
- **Berry phase mediated entanglement in a cavity QED setup** | Tsinghua University, Beijing

Skills

Programming	Python (advanced), Wolfram Mathematica (advanced)
Typesetting and designing	LaTeX, Adobe Illustrator, Inkscape, Adobe Lightroom, MS Office
Research skills	Project and data management, quantitative modeling, optimization
Qualities	Team leadership, public speaking, perseverance, social
Languages	English (fluent), Hindi (native)

Talks/Conferences

Mar 16-21, 2025	APS Global Physics Summit, Los Angeles *[Talk]*
Sep 23-27, 2024	ML4Q Summer School on Quantum Error Correction, Bonn *[Poster]*
Jun 23-28, 2024	6th Seefeld Workshop on Quantum Information *[Poster]*
Feb 02, 2024	106th Riken Quantum Computing (RQC) seminar *[Invited talk]*
Jan 13-19, 2024	Quantum Information Processing (QIP) 2024, Taipei *[Poster]*
Dec 17-19, 2023	Quantum Information Technology (QIT) 49th edition, OIST *[Poster]*
Nov 27 - Dec 01, 2023	Feedback in Quantum Machines (FQM) 2023, OIST
Jul 19-21, 2023	Quantum Networks Workshop (QuNeW) 2023, Boston *[Poster]*
2022-2023	6th, 7th, 8th, 9th Quantum Software Consortium (QSC) General Assembly
Jul 01-30, 2022	IBM Quantum Error Correction Summer School 2022 *[Prestigious]*
Nov 23-27, 2020	Q-Turn 2020 *[Best poster award]*

Miscellaneous

Awards and Achievements

2016-2020

- **UG Research Excellence:** Secured prestigious research visit scholarships and completed 8 internships in quantum computation, error-correction, and experiments
- **Founder/Governor:** Astrophysics club, IIT Kharagpur

Miscellaneous (continued)

2015 **Merit Award:** Within top 0.05% out of 1.2M students that appeared for JEE (IIT) exam

Hobbies and Extracurricular

- **Quantum community engagement:** **#qecarxiv** - concise daily summaries of quantum error correction preprints on X and LinkedIn. Shared 500+ preprints so far.
- **Extreme sports:** Skydiver at Skydive Rotterdam, and trained in parkour and kickboxing
- Chess (rated 1700+), photography *[sidnaps]*, stock market analysis and strategy making, traveling, reading books and science magazines