

CONTACT

SKILLS

Python	4+ yrs
Qiskit	2+ yrs
Git	2+ yrs
Simulation	3+ yrs
Modeling	2+ yrs

LANGUAGES

English	Bilingual
Hindi	Native
Italian	Elementary

HOBBIES

Calisthenics
Athletics
Hiking

VINAY KUMAR

Quantum Researcher & Engineer

WORK EXPERIENCE

Doctoral Researcher

IIT-CNR - Tuscany, Pisa (Italy)

⇒ Researched and developed enhanced routing protocols and algorithms for quantum internet.

⇒ Designed and implemented simulation models to evaluate the performance of quantum networks based on key metrics.

⇒ Reviewed quantum internet technologies, protocols, applications, and challenges, culminating in the submission of a comprehensive review paper.

Nov 22 - Nov 24

Project Fellow

IIT Hyderabad - Hyderabad, Telangana (India)

⇒ Conducted independent research on reservoir computing for nonlinear dynamical systems under Dr. K. Nithyanandan (IIT Hyderabad).

⇒ Implemented NVAR models to predict the strange attractor in the Rikitake geomagnetic reversal model, contributing to the master's thesis.

May 21 - May 22

Research Intern

Qulabs Software India Pvt Ltd. - Hyderabad, Telangana (India)

⇒ Collaborated with a research group of 5-8 members, delivering weekly presentations, facilitating daily discussions, and mentoring incoming interns.

⇒ Surveyed quantum memory protocols and their applications, contributing to the development of an internal research article.

Jan 21 - Jun 21

EDUCATION

Ph.D. - Information Engineering

University of Pisa - Tuscany, Pisa (Italy)

Topic: Quantum Internet.

M.Sc. - Physics

IIT Hyderabad - Hyderabad, Telangana (India)

Passed with 8.90/10 CGPA.

B.Sc. (Hons.) - Physics

University of Delhi - New Delhi, Delhi (India)

Passed with 8.07/10 CGPA.

2022 - 2025

2020 - 2022

2017 - 2020

PUBLICATIONS

Kumar, Vinay, et al. "Quantum Internet: Technologies, Protocols, and Research Challenges" (2024).

Kumar, Vinay, et al. "Routing in Quantum Networks with End-to-End Knowledge." arXiv preprint arXiv:2407.14407 (2024).

Kumar, Vinay, et al. "Routing in Quantum Repeater Networks with Mixed Noise Figures." arXiv preprint arXiv:2310.08990 (2023).

Nov 2024

Jul 2024

Oct 2023

ACHIEVEMENTS

IBM Quantum Challenges

1. 2024 (Advanced badge)
2. Spring 2023 (Advanced badge)
3. Fall 2022 (Advanced badge)
4. Africa 2021 (Advanced badge)
5. Fall 2021 (Advanced badge)
6. Spring 2021 (Secured rank 97 out of 1431 participants and advanced badge)

IBM certified Associate Developer Quantum Computation using Qiskit v0.2X

IBM certified badge

Technical Poster Presentation on Reservoir Computing

Secured 3rd place in technical poster presentation on National Science Day

Joint Entrance Screening Test (JEST)

1. 2022 for Ph.D. admissions: Achieved All India Rank 326 with 93.61 Percentile
2. 2020 for Int-PhD admissions: Achieved All India Rank 312 with 95 Percentile

IIT-JAM, Physics 2020

Secured All India Rank of 599 among 16379 candidates with 96.34 Percentile

CONFERENCES & WORKSHOPS

IEEE Future Networks World Forum
IEEE

15-17 Oct 2024

CERTIFICATIONS AND SCHOOLS

2024 Qiskit Global Summer School: The Path to Utility
IBM, Certificate of Quantum Excellence

Aug 2024

Introduction to quantum circuit transpilation and simulate the dynamics of a Heisenberg spin chain with a transverse field at a utility-scale.

2023 Qiskit Global Summer School: Theory to implementation
IBM, Certificate of Quantum Excellence

Aug 2023

Introduction from theory to implementation in quantum computing.

Quantum Communications School
Organised by University of Padua

May 2023

An up-to-date overview of quantum communications technologies involving the latest protocols, experimental implementations, and active networks given by scientists from within the program and external experts, including experimentalists, theoreticians, and industrial partners.

2022 Qiskit Global Summer School on Quantum Simulations
IBM, Certificate of Quantum Excellence

Aug 2022

Introduction to quantum computing and its applications to quantum simulation, with a specific focus on quantum chemistry.

2021 Qiskit Global Summer School on Quantum Machine Learning
IBM, Certificate of Quantum Excellence

Aug 2021

Introduction to quantum computing and machine learning, followed by a deep dive into QML theory, and an introduction to applications using real quantum computers.

Introduction to Quantum Computing
Issued by The Coding School

May 2021

An 8-month long course focusing on foundational understanding of quantum computing.

OTHER PROJECTS AND HACKATHONS

Pan-European Quantum Internet Hackathon 2024
(Delft node)

Feb 2024

Tool: Python, Squidasm

Extended the implementation of QKD protocol with key reconciliation, privacy amplification, and channel authentication in squidasm.

IITR Quantum Hackathon (Qiskit Fall Fest 2021)

Oct 2021

Tool: Python, Qiskit

Implemented the paper, "The effect of data encoding on the expressive power of variational quantum Machine Learning models" using Qiskit.

DICHIAZIONE SOSTITUTIVA DI CERTIFICAZIONE (art. 46 e 47 D.P.R. 445/2000)

Il sottoscritto Vinay Kumar, ai sensi e per gli effetti degli articoli 46 e 47 e consapevole delle sanzioni penali previste dall'articolo 76 del D.P.R. 28 dicembre 2000, n. 445 nelle ipotesi di falsità in atti e dichiarazioni mendaci, dichiara che le informazioni riportate nel presente curriculum vitae, redatto in formato europeo, corrispondono a verità.