Namasi G. **Sankar**

PhD Student · University College Dublin

namasivayam.gomathisankar@ucdconnect.ie | https://namasi-phd.github.io | Namasi-PhD | Google Scholar

Personal Profile

PhD researcher in quantum computing at University College Dublin with a strong focus on quantum algorithms and optimisation. Led the development of the HADOF, a novel approach that significantly advances the state of the art by enabling scalable optimisation beyond current literature and hardware limitations. Proven ability to translate theoretical methods into practical solutions, with expertise that directly aligns with my PhD research on applying quantum optimisation to NP-hard problems in genomics. Combines deep technical expertise alongside leadership roles including PhD School Representative for Computer Science at UCD and mentoring an iGEM team to a Gold award.

Education

University College Dublin

Dublin, Ireland

PhD — *Sep, 2024 - Present*

`https://www.ucd.ie/graduatestudies/researchstudenthub/researchprogrammes/`

Indian Institute of Science Education and Research (IISER), Pune

Pune, India

BS-MS Integrated — *Aug, 2019 - May, 2024*

`https://www.iiserpune.ac.in/education/programmes/bs-ms-programme`

Experience

Practical Quantum Optimisation for Combinatorial Problems in Genomics

UCD, Dublin, Ireland

Simon Caton, Georgios Miliotis — *2025-Present*

- Developed quantum optimisation algorithms for combinatorial genomics problems, with a focus on scalable QUBO formulations within a standard genome assembly pipeline using real datasets.
- Proposed and implemented the Hamiltonian Auto Decomposition Optimisation Framework (HADOF), extending optimisation beyond current qubit and hardware limitations [1].
- Designed a High Performance Quantum (HPQ) framework by parallel execution of HADOF.

UCD School of CS PhD Representative

UCD, Dublin, Ireland

2025-Present

- PhD School Representative to mediate between students and faculty, community engagement and presenting feedback from surveys and cohort engagement.
- Founded and lead a “Dry Run Club” for practice presentations and organise community engagement initiatives to enhance research communication, collaboration, and peer support.

Causal study on carbon premium in stock value

IISC, Bangalore, India

Prof. Sankarshan Basu, Prof. Siddhartha Pratim Chakrabarty, Suryadeepto Nag — *October 2023 - May 2024*

- Investigated whether firms’ emissions is causally linked to the presence of a carbon premium using fixed-effects analysis with propensity score weighting.
- Results suggest a positive carbon premium associated with Scope 1 emissions, implying that risks associated with direct emissions by firms are priced [2].

Master’s thesis on Quantum Reinforcement Learning

TCS Research, Bangalore, India

Dr. M. Girish Chandra, Ankit Khandelwal — *May 2023 - May 2024*

- Causal-Based learning methods applied to Deep Reinforcement Learning to improve performance.
- Evaluated Quantum-Enhanced neural networks for their performance in Reinforcement Learning [3].

Quantum Game theory

IIT, Bombay, India

Prof. Ankur Kulkarni — *Aug. 2022 - Jan. 2023*

- Implementing strategies using quantum entanglement in team decision problems to give lower Nash equilibrium cost than optimal classical strategies.

Space dependant diffusion Brownian Motion

IISER, Pune, India

Prof. Arijit Bhattacharyay — *Jan. 2022 - Jan. 2023*

- Simulated space dependent diffusivity of Brownian motion using molecular dynamics.
- Exploration into whether Ito’s or Stratonovich’s method of stochastic integration is suitable to obtain a generalized Langevin equation to describe Brownian motion.

iGEM (The International Genetically Engineered Machine)

IISER, Pune, India

Participant, Mentor — *Feb. 2021 - Nov. 2022*

- iGEM is the world's largest synthetic biology competition associated with MIT, Boston.
- Developed synthetic genetically modified bacteria co-culture to convert atmospheric carbon dioxide into bio-fuel.
- Simulated metabolite networks and population growth of bacteria.
- Gained immense experience in outreach, science education, sponsorship and entrepreneurship [4].
- Won gold in iGEM 2021 with nominations for Best Manufacturing Project and Best Education.
- Mentored a team that won gold in the iGEM 2022 competition.
- The project Hydrazome aims to help plants deal with excessive waterlogging by making use of a modified bacteria as a bio-fertilizer.
  `https://2021.igem.org/Team:IISER-Pune-India`
  `https://2022.igem.wiki/iiser-pune-india/`

Mean Field Game theory

IISER, Pune, India

Prof. Anindya Goswami — *Aug. 2021 - Dec. 2021*

- Generalized a Quantum Mechanical formalism of Game theory to a Mean Field approach based on Montin, B. S. (2004). A Stock Market Agent-Based Model Using Evolutionary Game Theory and Quantum Mechanical Formalism.

Stochastic Processes

IISER, Pune, India

Prof. Anindya Goswami — *Jun. 2021 - Aug. 2021*

- Verified and simulated theoretical behaviour of Ornstein–Uhlenbeck process in financial markets and option pricing.

Pedagogy design

IIT, Chennai, India

NPTEL — *Dec. 2019 - Jan. 2020*

- Assisted NPTEL in developing an online Data Science course for Indian Institute of Technology, Madras (IIT-M).
  `https://study.iitm.ac.in/ds/`

Research Science Initiative

IIT, Chennai, India

Prof. Karthik Raman — *Apr. 2018 - Jun. 2018*

- 2-month long residential and paid research internship program by MIT, Boston held at IIT-M.
- Understanding DNA computation and focused on how to represent information in nucleotides and perform computation.

Awards

2025 **Quantum Credits**, IBM Qiskit
- Received 12 hours of QPU usage credits worth $55k through successful application.

2024 **UCD School of CS Scholarship**, UCD
- Received full scholarship and additional stipend of €25k per year for 4 years.

2022 **Gold Medal**, iGEM Team Mentor
- Mentored a team that won gold in the iGEM 2022 competition.

2021 **Gold Medal**, iGEM (The International Genetically Engineered Machine)
- Won gold in iGEM 2021 with nominations for Best Manufacturing Project and Best Education.

2019 **KVPY Scholar**, Kishore Vaigyanik Protsahan Yojana Scholarship
- Scholarship programme funded by the Department of Science and Technology of the Government of India, awarded to the top 2% of students aspiring to do science.

Skills

Programming	C++, Fortran, Python, MATLAB, R, Unity, GitHub, JavaScript, LaTeX
Algorithms and Numerical Methods	Hands-on experience with quantum devices and supercomputers
Science Communication	Contribution to Accessible Science Education: iGEMIISERPune
Teaching	Student demonstrator for Undergaduate and Master's modules at UCD

Presentations

AIQxQAI Workshop at ECAI

Bologna, Italy

Workshop Presentation — *Oct, 2025*

- Presented the results of **Scalable quantum optimisation using HADOF** at AIQxQAI, ECAI 2025.

COMSNETS 2024 Conference

Bangalore, India

Conference Presentation — *Jan, 2024*

- Presented the results of **Quantum-Enhanced Resilient Reinforcement Learning Using Causal Inference** at COMSNETS 2024.

Publications

[1] Namasi G. Sankar, Georgios Miliotis, and Simon Caton, “Scalable quantum optimisation using HADOF: Hamiltonian auto-decomposition optimisation framework,” in Proceedings of the 3rd International Workshop on AI for Quantum and Quantum for AI (AIQxQIA 2025), co-located with the 28th European Conference on Artificial Intelligence (ECAI 2025), ser. CEUR Workshop Proceedings, vol. 4153. Bologna, Italy: CEUR-WS.org, 2025, pp. 63–72.

[2] Namasi G. Sankar, Suryadeepto Nag, Siddhartha P. Chakrabarty, Sankarshan Basu, ”The carbon premium: Correlation or causality? Evidence from S&P 500 companies,” Energy Economics, Volume 134, 2024, 107635, ISSN 0140-9883

[3] Namasi G. Sankar, Ankit Khandelwal, Girish Chandra, ”Quantum-Enhanced Resilient Reinforcement Learning Using Causal Inference,” 2024 16th International Conference on COMmunication Systems & NETworkS (COMSNETS), Bengaluru, India, 2024, pp. 1058-1063

[4] Namasi G. Sankar, Arya Narnapatti, SteadyCom Tutorial
This document familiarises users with the requirements of a multi-organism COBRA model for SteadyCom.