Md Shadnan Azwad Khan

Curriculum Vitae
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Research Interests

Quantum Algorithms • Quantum Machine Learning • Neuromorphic Computing • Bio-inspired Robotics

Education

Master of Science in Computer Science — Quantum Information *September, 2023 – September, 2025*
Sorbonne Université *Paris, France*

Thesis: "Photon-native Quantum Perceptron and Neural Network."
Advisor: Dr Daphne Wang (*Quandela*).

First Year Research Project: "Hidden Nonlocality."
Academic Exchange: *External Student*, University of Copenhagen *March, 2024 – June, 2024*
Participated in "Quantum Information and Quantum Many-Body Theory", 4EU+ Alliance Shared Course.

Bachelor of Science in Electrical and Electronic Engineering with a second major in Computer Science *May, 2013 – December, 2018*
Brac University *Dhaka, Bangladesh*

Thesis: "A New Multi-Robot Search Algorithm Using Probabilistic Finite State Machine and Lennard-Jones Potential Function."
Advisors: Dr Mohammad Hasan (*University of Staffordshire*), Dr Tarem Ahmed (*BRAC University*).
Academic Exchange: *Erasmus + Visiting Student*, University of Staffordshire *May, 2017 – August, 2017*

Final Year Design Project: "SLAM with an Autonomous Robot."
Advisors: Dr Tarem Ahmed (*BRAC University*), Moin Mostakim (*BRAC University*).

Relevant Experience

Graduate Research Intern *March, 2025 – September, 2025*
Quandela *Massy, France*
Research Areas: Photon-native Quantum Perceptrons and Neural Networks, and Photonic Quantum Reservoir Computing.

Research Assistant *March, 2019 – August, 2023*
Independent University, Bangladesh *Dhaka, Bangladesh*
Research Areas: Swarm Intelligence, Unsupervised Machine Learning, Network Anomaly Detection, and Health Informatics.

Freelance Developer (Web & Digital Media) *November, 2017 – August, 2023*
Freelance / Self-employed *Dhaka, Bangladesh*
Activities: Web development and digital media work (websites, tools, graphics and videos) for businesses, NGOs, and independent professionals; discussing requirements with non-technical clients, implementing solutions, and providing maintenance.

Substitute Information and Communications Technology Teacher *July, 2012 – November, 2012*
The Aga Khan School, Dhaka *Dhaka, Bangladesh*
Duties: Lesson planning, classroom instruction, and laboratory supervision.

Skills

Natural Languages
English *(Fluent, C2 Proficiency)* • Bangla *(Fluent, Native Proficiency)* • French *(Beginner)*

Programming & Technical Tools
Python *(NumPy, TensorFlow, PyTorch)* • Java • C/C++ • CUDA • MATLAB • LaTeX • Mathematica • SageMath • Maple

Grants and Fellowships

YQIS25 Fellowship, Institute of Photonic Sciences (ICFO) *2025*
QICS Scholarship Grant, Quantum Information Center Sorbonne *2024 — 2025*
4EU+ Short-Term Mobility Grant at Centre for the Mathematics of Quantum Theory, 4EU+ Alliance *2024*
Solidarity Scholarship, Groupe des Anciens, Sorbonne Université *2024*
Learning Mobility Grant at University of Staffordshire, Erasmus+ Key Action 1 Programme *2017*

Peer-Reviewed Publications

Google Scholar counts 28 citations and h-index of 4 (December 2, 2025).

[**A1**] Qi Huang, Emanuele Mezzi, Osman Mutlu, Miltiadis Kofinas, Vidya Prasad, **Shadnan Azwad Khan**, Elena Ranguelova, and Niki van Stein.
Beyond the Veil of Similarity: Quantifying Semantic Continuity in Explainable AI.
In *The 2nd World Conference on eXplainable Artificial Intelligence (xAI 2024)*, pp. 308-331, 2024.
DOI: 10.1007/978-3-031-63787-2_16, Preprint: arXiv:2407.12950.

[**A2**] **Muhammad S. A. Khan**, Tarem Ahmed, and Mohammad Faisal Uddin.
Multi-Robot Search Algorithm Using Timed Random Switching of Exploration Approaches.
In *IEEE Region 10 Symposium (TENSYMP)*, pp. 868–871, 2020.
DOI: 10.1109/TENSYMP50017.2020.9230829.

[**A3**] **Muhammad S. A. Khan**, Mohammad S. Hasan, and Tarem Ahmed.
A New Multi-Robot Search Algorithm Using Probabilistic Finite State Machine and Lennard-Jones Potential Function.
In *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, pp. 850–855, 2018.
DOI: 10.1109/ROBIO.2018.8665082.

[**A4**] **Muhammad S. A. Khan**, Shoumik S. Chowdhury, Nafis Niloy, Fatema Tuz Zohra Aurin, and Tarem Ahmed.
Sonar-Based SLAM Using Occupancy Grid Mapping and Dead Reckoning.
In *TENCON 2018 — IEEE Region 10 Conference*, pp. 1707–1712, 2018.
DOI: 10.1109/TENCON.2018.8650124.

Conference Poster Presentations

[**P1**] **Md Shadnan Azwad Khan**, Daphne Wang.
Photon-native Quantum Perceptrons and Neural Networks.
Poster presented at the *Young Quantum Information Scientists Conference 2025 (YQIS25)*, Spain.
Poster: Available online.

[**P2**] Mirko Cervi, Virginie Chen, Valentina Galbiati, **Md Shadnan Azwad Khan**, Matyáš Lorenc, Caroline Pilet.
Hidden Nonlocality.
Poster presented at the *4EU+ Quantum Information and Quantum Many-Body Theory Summer School*, Copenhagen.
Poster: Available online.

[**P3**] **Md Shadnan Azwad Khan**, Merve Rumelli, Natalia Capra Ferrazzo.
Investigating Quantum Reservoir Computing for Time Series Forecasting.
Poster presented at the *Paris Centre for Quantum Technologies (PCQT) Workshop*.
Poster: Available online, Report: Available online.

Selected Projects

[**C1**] *Resolving Photon Numbers from SNSPD Signals by Machine Learning.*
Challenge runners-up for the *QST Hack 2025*.

[**C2**] *Do Machines Learn Non-Explicit Semantics?*
Case study at *ICT with Industry 2024*, Lorentz Center. Subsequently expanded into a peer-reviewed publication at the *xAI 2024*.
Code: Available online.

[**C3**] *Quantum Digital Payment.*
Implementation for the *Pan-European Quantum Internet Hackathon 2024*. Code: Available online.

[**C4**] *GPU-Accelerated Crank-Nicolson PDE Simulation of Bullet Options utilizing Parallel Cyclic Reduction.*
Project for the *Advanced High Performance Computing* course, Sorbonne Université.