Curriculum Vitae – Avner Bensoussan

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Research Objective

I am a motivated researcher with an expertise in Quantum Software Testing. My goal is to advance the understanding and development of testability in Quantum Software and Hybrid Quantum-Classical systems. My work focuses on Quantum Software Testability, Formal Verification, Quantum Information Theory, and the design of testing frameworks for emerging quantum-classical architectures.

Education

Sept 2020 – June 2023 **B.Sc. in Computer Science (AI Pathway)**,
King's College London, UK
Final Project: *Testing the Ethical Decision-Making of Autonomous Vehicles*

Research Experience

Oct 2023 – Present **PhD Candidate**, Department of Informatics, King's College London
- Investigating testing methods for hybrid quantum-classical architectures.
- Defining a novel metric for quantum testability: Quantum Squeeziness.
- Developed a taxonomy of real faults in these systems.
- Prospective Graduation March 2027

May 2023 – Sept 2023 **Fellow Researcher**, Department of Informatics,
King's College London
- Investigated testing approaches for autonomous vehicles using Carla and ROS.
- Designed and executed experiments to evaluate realism in simulation environments.
- Collaborated with Dr. Qunying Song (UCL), which resulted in a publication in *Automated Software Engineering* (see details below).

Publications

- **A. Bensoussan**, et al. (2025). *A Taxonomy of Real Faults in Hybrid Quantum-Classical Architectures. arXiv* – Accepted ACM TOSEM. [arXiv]
- D. Blackwell, **A. Bensoussan**, et al. (2024). *Fuzzing-Based Differential Testing for Quantum Simulators.* In: *Proceedings of SSBSE 2024*, pp. 63–69. [Springer Link]
- G. d'Aloisio, **A. Bensoussan**, et al. (2024). *Exploring LLM-Driven Explanations for Quantum Algorithms. ESEM 2024*, pp. 475–481. [ACM]
- **A. Bensoussan**, et al. (2024). *Accelerating Quantum Eigensolver Algorithms With Machine Learning. arXiv* – Accepted at OOPSLA 2025. [OOPSLA]
- Q. Song, **A. Bensoussan**, et al. (2025). *Synthetic versus real: an analysis of critical scenarios for autonomous vehicle testing. Automated Software Engineering*, Volume 32. [Springer]
- V. Klimis, **A. Bensoussan**, et al. *Shaking Up Quantum Simulators with Fuzzing and Rigour.* – Accepted at OOPSLA 2025. [OOPSLA]
- **A. Bensoussan**. *Quantum Squeeziness: An Information Theoretical Metric for Quantum Software Testability.* (Submitted at ICST)

Conferences & Presentations

Dec 2025	Lecture: **Testing Hybrid Quantum-Classical Systems**, Prof. Mousavi's Master and 3rd year Bachelor Testing module, King's College London
Nov 2025	Poster: **Quantum Squeeziness: An Information Theoretical Metric for Quantum Software Testability**, Advanced Quantum Algorithms for Many-body systems Workshop, Montpellier
Oct 2025	Talk: **AccelerQ: Accelerating Quantum Eigensolvers with Machine Learning on Quantum Simulators**, Talk: **Shaking Up Quantum Simulators with Fuzzing and Rigour**, OOPSLA 2025, Singapore
Oct 2024	Poster: **A Taxonomy of Real Faults in Hybrid Quantum-Classical Architectures**, PICS Summer School, ITU Copenhagen
Sept 2024	Poster: **A Taxonomy of Real Faults in Hybrid Quantum-Classical Architectures**, SeeQa, Oxford University
Dec 2023	Talk: **Synthetic versus real: an analysis of critical scenarios for autonomous vehicle testing**, MDENET

Awards & Honors

2022	B'NAI B'RITH UK – Rothschild Institute Award

Technical Skills

Programming Languages: Python, C, C++, R, Scala, MATLAB
Frameworks & Tools: Qiskit, Cirq, Pennylane, Tensorflow Quantum, ROS, Carla, Git, LaTeX
Languages: French (Native), Hebrew (Fluent), English (Fluent), Portuguese (Beginner), Arabic (Beginner)

References

Prof. Mohammad Reza Mousavi
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Prof. George Booth
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Dr. Karine Even-Mendoza
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