Atharva Vidwans

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EDUCATION

University of Wisconsin Madison   **Aug '24 – Current**
PhD, Chemistry

University of Wisconsin Madison   **Aug '22 – May '24**
M.S. Physics-Quantum Computing

Savatribai Phule Pune University   **July '15 – June '19**
Bachelor of Engineering, Mechanical Engineering

PUBLICATIONS

Atharva Vidwans[†], Jingcheng Dai[†], John M. Hawthorne, Eric H. Wan and Micheline B Soley, 'Quantum Deflated Resonance Identification Variational Eigensolver (qDRIVE) Algorithm for Molecular Resonances on Near-Term Quantum Computers' (in preparation)

Atharva Vidwans[†], Qilin Li[†], Yazhen Wang and Micheline B. Soley, 'Harnessing Bayesian Statistics to Accelerate Iterative Quantum Amplitude Estimation', arXiv preprint arXiv:2507.23074, 2025.

Vidwans, A. S. (2021). Cognitive computing in autonomous vehicles. In Cognitive Computing for Human-Robot Interaction (pp. 121-146). Academic Press.

RESEARCH EXPERIENCE

Research under Prof. Matthew Otten (University of Wisconsin Madison)   **July '25 – Current**
Non-orthogonal Quantum Eigensolver with Bayesian Quantum Iterative Quantum Amplitude Estimation
- Working in Non-Orthogonal Quantum Estimation algorithm to improve the shots counts using BIQAE, reduce the number of Pauli terms of decomposition using double factorization and Tensor Hyper contraction and improve circuit depth.

Research under Prof. Micheline Soley (University of Wisconsin Madison)   **Jan '23 – June '25**
Quantum Deflated Resonance Identification Variational Eigensolver (qDRIVE) algorithm
- Developed and deployed quantum algorithm (qDRIVE) on simulators and IBM quantum hardware (<5% error), demonstrating skills in quantum algorithm design, optimization, and implementation of Complex Absorbing Potentials.

Bayesian Iterative Quantum Amplitude Estimation (BIQAE) algorithm   **May '23 – June '25**
- Improved existing Iterative Quantum Amplitude Estimation using Bayesian to estimate the energy of a state with much less counts compared to currently existing estimation techniques, demonstrating skills in quantum algorithm like Gover, IQAE and understanding of Bayesian techniques.

Research under Prof. Shimon Kolkowitz (University of Wisconsin Madison)   **Feb '23 – May '23**
Simulating surface codes using Qiskit
- Utilized Surface codes for generating single logical qubits implemented of X-cut and Z-cut qubits, as well as logical X, Y, Z, and H operations, achieving consistent fidelity and low error rates and explored the 'Braiding transformation' to entangle two logical qubits and investigated various caveats related to Surface codes, including the impact of initialization and readout errors on stability.

Research under Prof. Pawel Gora (University of Warsaw)   **June '21 – May '22**
Solving Vehicle Routing Problem using quantum computer
- Implemented a customized version of the Variational Quantum Eigensolver (VQE) combining layered-VQE and filtering-VQE augmented with Conditional Value at Risk (CVaR) techniques tailored to achieve precise solutions for the Vehicle Routing Problem with Time Windows (VRPTW) on Quantum Computers in Qiskit.

TEACHING EXPERIENCE

Teaching Assistant, General Chemistry CHEM 104	**Sept '25 – Current**
Teaching Assistant, Physical Chemistry 2 CHEM 562	**Jan '25 – May '25**
Teaching Assistant, General Chemistry CHEM 109	**Sept '24 – Dec '24**

PRESENTATIONS AND CONFERENCES

'Quantum Deflated Resonance Identification Variational Eigensolver (qDRIVE) Algorithm for Molecular Resonances on Near-Term Quantum Computers' **Atharva Vidwans** and Jingcheng Dia. Presented by Atharva Vidwans at Chicago Quantum Summit 2024, US

'Quantum Deflated Resonance Identification Variational Eigensolver algorithm for Molecular Resonances on Near Term Quantum Computers', **Atharva Vidwans** and Jingcheng Dia. Presented by Atharva Vidwans at Graduate Student Faculty Liaison Committee (GSFLC), US **Aug '23**

'Solving Vehicle Routing Problem using Variational Quantum Eigensolver', **Atharva Vidwans** and Walid el Maouaki, Presented by Atharva Vidwans at 13th Warsaw IT days Conference, Poland **April '22**

PROFESSIONAL SERVICE

Reviewer for Quantum Machine Intelligence (Springer)	**June '23**

SKILLS

Python (NumPy, SciPy, OpenFermion, PySCF), Qiskit (Aer, Nature, Primitives), Docker, High Throughput Computing (HTC Condor), Complex Absorbing Potentials (CAPs)

CERTIFICATIONS AND AWARDS

IBM Quantum Qiskit v0.2X Associate Developer Certificate	**Jan '22**
Fourth Place in International IBM Quantum Qiskit 2021 Competition	**June '21**
Fourth Place in National IBM Qiskit Challenge (India)	**Sept '20**