

Cameron Cianci

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Education

University of Connecticut, Storrs, CT
Majors: Honors Physics, Computer Science
Minor: Mathematics
GPA 3.749/4.0

Work History

Scientist, Mirion Technologies, Meriden, CT, 06450, 03/2023 to present

- Research and develop AI/ML predictive maintenance models for HPGe sensors.
- Collaborate closely with data scientists, nuclear engineers, and shareholders to analyze complex datasets and propose novel solutions for clientele.

Research Assistant, UConn PNB, Storrs, CT, 06260, 05/2023 to 08/2023

- Work with a team of graduate students under the guidance of Dr. Linnea Ostroff to develop novel image registration algorithms.
- Worked with Computer Vision models such as ResNet-50.

Physics Tutor, UConn Q-Center, Storrs, CT, 06269, 9/2021 to 12/2022

- Teach students in undergraduate level physics courses
- Lecture students and work through homework or example problems

Research

UConn Graduate Quantum Computing and Quantum Chaos Research, 8/2023 to present
Quantum Computing and Quantum Chaos Research - UConn, CT

Developed simulation algorithms of quantum chaotic systems with Professor Lea Santos and in collaboration with Professor Victor Batista at the Yale Quantum Institute. I have focused on simulating the LMG model with the VQD, SSVQE, QITE, and QIPA algorithms. Additionally I have been exploring novel excited state simulations in QITE.

UConn Undergraduate Quantum Chromodynamics Research, 12/2021 to 12/2022

Lattice QCD Physics Research - UConn, CT

Work with Professors Luchang Jin and Thomas Blum to simulate the linear sigma model on the lattice exploring both Fourier acceleration and a conditional GAN neural network.

UConn Undergraduate Computer Vision Research, 05/2022 to 12/2022

AI Computer Vision Research - UConn, CT

Work with Dr. Jinbo Bi in collaboration with Travelers Insurance agency to automatically detect insurance claims with models such as the Swin Transformer and ConvNeXt models.

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UConn Undergraduate Quantum Cryptography Research, 02/2022 to 12/2022

Quantum Cryptography Research - UConn, CT

Work with Dr. Walter Krawec on defining security in Quantum Secure Direct Communication Schemes taking inspiration from classical cryptography and QKD.

University of Texas Rio Grande Valley Summer REU in Nanophotonics, 05/2021 to 08/2021

Classical and Quantum Optical Computing Research - UTRGV, TX

Worked with Dr. Malik Rakhmanov to study classical and quantum optical computing. Designed classical and quantum silicon waveguide chips for future manufacturing.

UConn Undergraduate Superconducting Research, 09/2020 to 05/2021

Superconducting Physics Research - UConn, CT

Worked with a team of graduate students and Dr. Ilya Sochnikov to study the effect of stress and torsion on superconductors using helium dilution refrigerators and SQUID microscopy.

Publications and Preprints

Cianci, C. (2023). Security of One-Way Entanglement Purification with Quantum Sampling Against a Restricted Adversary. *arXiv preprint arXiv:2306.10455*.

Cianci, C. (2023). The Quantum-Extended Church-Turing Thesis in Quantum Field Theory. *arXiv preprint arXiv:2309.09000*.

Cianci, C. (2023) Toward Constructing a Continuous Logical Operator for Error-Corrected Quantum Sensing. *Journal of Quantum Information Science*, **13**, 45-55. doi: [10.4236/jqis.2023.132004](https://doi.org/10.4236/jqis.2023.132004).

Cianci, C., Jin, L., & Swaim, J. (2023, April). Fourier Acceleration in a Linear Sigma Model with Spontaneous Symmetry Breaking. In *The 39th International Symposium on Lattice Field Theory* (p. 254).

Cianci, Cameron, "Fourier Acceleration in the Linear Sigma Model" (2022). *Honors Scholar Theses*. 926. https://opencommons.uconn.edu/srhonors_theses/926

Relevant Graduate Coursework

Quantum Mechanics (5402)

Many Body QFT (5403)

Nuclear and Particle Physics (6320)

General Relativity (6730)

Quantum Theory of Fields (6341)

Condensed Matter Physics (6201)

Algorithms (5500)

Machine Learning (5819)

Operating Systems (5305)

Machine Learning for Phys. Sci. (5835)

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Awards and Honors

- Acceptance into the UConn Honors and STEM Scholar program
- New England Scholar 2022
- UConn CLAS Dean's List Fall 2019, Fall 2021, and Spring 2022
- Acceptance into Sigma Pi Sigma Physics Honors Society

Programming Skills

- Python, C++, C, HTML, Javascript, PHP, SQL
- QISKIT and QuTiP
 - Experience with variational algorithms such as QAOA, VQE, VQD, SSVQE, QITE, and QCNN
- Pytorch and Tensorflow
 - Experience with LSTM, CNN, GAN, and VAE network architectures

Invited Talks

Predictive Maintenance - Mirion Innovation Exchange Conference, MIX (8/10/2023)

Introduction to QISKIT - Santos Group (7/28/2023)

Excited State Variational Quantum Eigensolvers - Santos Group (8/4/2023)