

JONAH SACHS

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GitHub: <https://github.com/Jsachs14/Sachs-Github>; Website: <https://www.jonahmsachs.com/>

EDUCATION

Washington University, St. Louis, MO

GPA: 3.75

Double Major in Computer Science (McKelvey School of Engineering) and Physics (College of Arts & Sciences)

Double Minors in Quantum Engineering and Nanoscale Science and Engineering

- Coding Language Experience: Python, Arduino C, MATLAB, Java, C++, R, LaTeX
- Computer Science Project Experience: Data Science and Visualization, Embedded Systems Software and Control Systems, Machine Learning for Quantum Computers and Physical Systems, Physical Modeling using C++, On and Off-board Software Production for FSAE Racing Vehicles
- Fabrication Instruments Utilized: AJA E-Beam Evaporator, Asher, Dicing Saw, Elionix Electron Beam Lithography (EBL), Heidelberg Laser Writer, Kloe Mask Aligner, Oxford ICP/RIE, Profilometer, Spin Coater, Scanning/Tunneling Electron Microscope

2021 – May 2025

EXPERIENCE

WashU Department of Physics and Institute of Materials Science (Mentor: James Buckley)

Summer 2024 – Present

Fabrication of Josephian Parametrized Amplifiers

- Learned and optimized an established Dolan Bridge procedure for fabricating nanoscale Josephson Junctions (JJs).
- JJs tuned around a resonant frequency to produce parametric amplification for cavity-based photon detection.
- JJs prototyped and packaged for cryogenic environments to contribute to readout for the ADMX experiment @ WashU.

Fabrication of a Shot Noise Tunnel Junction

- Optimized the DWL 66+ Heidelberg Laser Writer for minimal positive feature size.
- Produced an optical lime-soda mask for tuning junction normal resistance towards 50 Ω .
- Fabricated microscale JJs to linearize the system gain and system noise JPAs used for the ADMX experiment.

WashU Racing (FSAE), St. Louis, MO

Fall 2022 - Present

Lead of the Electronics and Data Acquisition team

- Managing a team of 12 engineers creating the electrical system for a Student Formula Vehicle.
- Running the design and buildup of custom PCBs, communication systems, and over 50 attached sensors.
- Gaining skills in firmware production, electrical debugging and production, and engineering design processes and management.
- Current Notable Projects: Live Telemetry, Error Detection and Digital Circuit Breaking, Improved Data Analysis

WashU Department of Chemical Engineering and Mathematics (Mentor: Grigoriy Yablonsky)

Spring 2024 – Present

Academic Research in Data Science and Chemical Engineering

- Working with statistical analysis and the visual modeling of chemical kinetic systems. Focusing on the conservatively perturbed equilibrium (CPE) chemical event with applications to joint kinetics.
- Published and in process of further publications with professors in both Chemical Engineering and Mathematics

WashU Department of Computer Science (Mentor: Ron Cytron)

Fall 2023 – Summer 2024

Academic Research and Independent Study in VQE and other algorithms for NISQ Applications

- Research surrounding Variational Quantum Eigensolvers (VQE) and other hybrid algorithms using Qiskit and D-Wave.
- Prepared and taught academic materials for an introductory quantum computing course in the basics of quantum machine learning.

NDSU Department of Computer Science, Fargo, ND (Mentor: Danling Wang)

Summer 2023 – Spring 2024

Machine Learning Research Experience Undergraduate

- Worked in data preparation, analysis, and regression and classification models for an experimental diabetes sensor.
- Designed and ordered sensor prototype using *Altium Designer*. Built up the PCB project for a clinical study.
- Traveled to the University of Santiago in Santiago, Chile, for further research.

Washington University Learning Center/Undergraduate Student Services, St. Louis, MO

Fall 2021 – Present

Academic Support Positions

- Teacher's Assistant: Introduction to Intelligent Agents Using Science Fiction, Introduction to Quantum Computing
- Academic Mentor/Engineering Tutor: Introductory Physics, Introduction to Computer Science

WashU Club Golf

Fall 2021 – Present

President and Treasurer of Club; Member of Competitive Tournament Team

PUBLICATIONS

Conservatively perturbed equilibrium and perturbation: Linear case

- Chemical Engineering Journal (CEJ)- <https://www.sciencedirect.com/science/article/pii/S1385894725021059?via%3Dihub> March 2025

Quantum Applications in the Automotive Industry

- Quantum Computing Report (QCR)- <https://quantumcomputingreport.com/quantum-applications-in-the-automotive-industry/> January 2025

Between Research and Responsibility: The Invention of Dynamite

- Substantia: An International Journal of the History of Chemistry- <https://riviste.fupress.net/index.php/subs/article/view/2536> September 2024

Applications of Quantum Computers to Optimization Problems

- Tech Writing Competition- https://www.jonahmsachs.com/Applications_of_Quantum_Computers_to_Optimization_Problems.pdf May 2024