

Joseph Dehoney

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Education

Stanford University	Stanford, CA
<i>M.S. in Computer Science</i>	Sep 2024 – Jun 2026 (exp.)
• GPA: 4.0	
Oregon State University	Corvallis, OR
<i>B.S. in Computer Science</i>	Jan 2022 – Jun 2023
• GPA: 4.0; <i>Summa Cum Laude</i> , Dean's List, Honor Roll, Engineering Scholarship.	
University of California, San Diego	San Diego, CA
<i>B.A. in International Business; Minor in History</i>	Sep 2015 – Jun 2019
• GPA: 3.9 (Major), 3.2 (Cumulative); Provost Honors.	

Work Experience

Quantum Information and Computing Group, Stanford University	Stanford, CA
<i>Graduate Research Assistant</i>	May 2025 – Curr.
• Investigated QCMA containment for the Kronecker coefficient positivity problem; as part of this work, extended a known hardness result for certain 2-point correlation functions to the 3-point setting.	
• Developed a SageMath toolkit to compute Kronecker coefficients and related representation-theoretic data, enabling systematic testing of candidate witnesses and conjectures across different bases.	
Pediatric Vascular Lab, Stanford University	Stanford, CA
<i>Graduate Research Assistant</i>	Jun 2025 – Curr.
• Built unit-tested Python pipelines for multimodal Fontan data (CPET, endothelial function, DEXA ALMI z , PedsQL, REDCap), standardizing scoring, de-identification, and cohort curation.	
• Assisted manuscript writing by translating pipelines and analysis metrics into clear methods/results text and publication-ready figures.	
Computational Neuroscience Laboratory, Stanford University	Stanford, CA
<i>Graduate Research Assistant</i>	Sep 2024 – Curr.
<i>Research Data Analyst</i>	May 2022 – Sep 2024
• Led multi-site harmonization for national, multimodal datasets (MRI, cognitive, clinical) with continuous, event-driven ingestion and rolling validation via APIs and site uploads.	
• Cut QC resolution time by ~80% via CI validators (pytest; schema/consistency) that prevent errors from entering the pipeline.	
• Lowered the open-issue backlog by ~30% with GitHub Actions that trigger Python services to reproduce errors, apply fixes, open PRs, and auto-close resolved items.	
• Delivered annual public releases as reproducible builds (Docker/Singularity on Slurm and AWS) across ~1 PB of data using release manifests and input–output lineage to guarantee exact rollback, and auditability.	
• Presented to NIH and consortium stakeholders on study schema, variable catalog, and release changes.	
• Trained staff on workflows and study structure; authored SOPs that standardized processes.	
CoolWine	Santa Rosa, CA
<i>Product Manager</i>	Jul 2019 – Apr 2021
• Assisted in design, fabrication, and deployment of industrial beverage facility coolant systems.	
Permanent Value Inc.	San Diego, CA
<i>Team Lead</i>	Jul 2016 – May 2018
• Managed 60 client investment portfolios totaling over \$15M in assets.	

Publications

- [1] M. Lui, L. Palaniappan, M. Leonard, J. Long, **J. Dehoney**, J. P. Cooke, I. Olson, T. R. Damase, S. Chen, J. Myers, D. Bernstein, and S. Tierney, “Exercise capacity, endothelial function, muscle mass, and strength in pediatric patients with fontan circulation,” *CJC Pediatric and Congenital Heart Disease*, 2025, ISSN: 2772-8129. DOI: <https://doi.org/10.1016/j.cjcp.2025.10.010>.
- [2] A. M. Morales, S. A. Jones, B. Carlson, D. Kliamovich, **J. Dehoney**, B. L. Simpson, K. A. Dominguez-Savage, K. O. Hernandez, D. A. Lopez, F. C. Baker, D. B. Clark, D. B. Goldston, B. Luna, K. B. Nooner, E. M. Muller-Oehring, S. F. Tapert, W. K. Thompson, and B. J. Nagel, “Associations between mesolimbic connectivity, and alcohol use from adolescence to adulthood,” *Developmental Cognitive Neuroscience*, vol. 70, 101478, 2024, ISSN: 1878-9293. DOI: <https://doi.org/10.1016/j.dcn.2024.101478>.
- [3] Q. Zhao, M. Paschali, **J. Dehoney**, F. C. Baker, M. de Zambotti, M. D. De Bellis, D. B. Goldston, K. B. Nooner, D. B. Clark, B. Luna, B. J. Nagel, S. A. Brown, S. F. Tapert, S. Eberson, W. K. Thompson, A. Pfefferbaum, E. V. Sullivan, and K. M. Pohl, “Identifying high school risk factors that forecast heavy drinking onset in understudied young adults,” *Developmental Cognitive Neuroscience*, vol. 68, 101413, 2024, ISSN: 1878-9293. DOI: <https://doi.org/10.1016/j.dcn.2024.101413>.
- [4] L. Kupis, Z. T. Goodman, S. Kornfeld, S. Hoang, C. Romero, B. Dirks, **J. Dehoney**, C. Chang, R. N. Spreng, J. S. Nomi, and L. Q. Uddin, “Brain dynamics underlying cognitive flexibility across the lifespan,” *Cerebral Cortex*, vol. 31, no. 11, 5263–5274, 2021. DOI: [10.1093/cercor/bhab156](https://doi.org/10.1093/cercor/bhab156).

Ongoing Projects

- [5] **J. Dehoney**, T. Kohler, and A. Bouland, “Towards qcma containment for kronecker coefficient positivity,” In preparation, 2025.

Graduate Projects & Presentations

Learning Quantum Gibbs States Locally & Efficiently [\[Report\]](#) Spring 2025

- Established when local Hamiltonian learning from thermal data is identifiable by linking a Gibbs-state inner product to exponential clustering and Lieb–Robinson locality at finite temperature.
- Analyzed sample/time complexity against classical Markov random field learning, reproducing variance bounds and delineating failure regimes driven by operator spreading and low-temperature effects.

Quantum Optimization of MIS with Rydberg Atom Arrays [\[Slides\]](#) Spring 2025

- Demonstrated how Max Independent Set on unit-disk graphs can be encoded in Rydberg arrays and implemented two variational schemes: shallow-depth QAOA and a piecewise-linear detuning-sweep VQAA.
- Evaluated both methods against simulated annealing (SA) using a tensor-network-based hardness score, showing that VQAA outperforms SA on harder graphs with gains correlated to larger spectral gaps.

Scaling PyG: Taming Massive Graphs [\[Article\]](#) [\[Colab\]](#) Fall 2025

- Enabled memory-safe GNN training on commodity GPUs by using neighbor/hierarchical sampling and distributed loaders in PyG.
- Assessed accuracy–time–memory trade-offs on public datasets and released a minimal, reproducible template with documented throughput metrics and an accompanying tutorial.

Technical Skills

Languages: Python, Bash, C++, SQL

Libraries: pandas, NumPy, SciPy, scikit-learn, PyTorch, PyG, TensorFlow, Matplotlib, Plotly

Quantum: Qiskit (Aer/Transpiler/Pulse), Cirq, QuTiP, Stim, Mitiq, pyGSTi, TKET

Tools: Airflow, Apptainer, AWS, CUDA, Docker, Git, Linux, OpenCL, OpenMP, REDCap, Slurm, XNAT