Jonathan Edward Ryan Gordon

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Education

Bowdoin College — **Brunswick, ME**
Majors in Physics and Mathematics with Minor in Arabic — *2022–2026 (Expected)*
GPA: 3.83/4.0
Relevant Courses: Quantum Mechanics, Methods of Experimental Physics, Methods of Theoretical Physics, Quantum and Relativity, Modern Electronics, Topology, Mathematical Principles of Machine Learning, Measure Theory, Quiver Representations, Probability, Linear Algebra.

Work Experience

Bowdoin College — **Brunswick, ME**
Mathematics Department Learning Assistant — *08/2024–Present*
- Fall 2025: Real Analysis | Spring 2025: Integral Calculus | Fall 2024: Real Analysis. Provided tutoring during weekly office hours.

Semiconductor Spectroscopy Group, Paul-Drude-Institut für Festkörperelektronik (PDI) — **Berlin, Germany**
DAAD RISE Scholar — *05/2025–08/2025*
- Designed and fabricated piezoelectric surface acoustic wave (SAW) devices to generate and control tunable acoustic vortices.
- Employed cleanroom nano-fab techniques (photolithography, metallization, sputtering, etching, bonding).
- Performed electrical (VNA S-parameters) and phase-resolved optical (Michelson interferometry) characterization of SAW devices.
- Developed Python tools for spectral analysis and quantification of SAW vortex topological charge.
- Selected as one of 250 students for the DAAD RISE program, a German federal research fellowship in STEM.

Center for Materials Data Science for Stockpile Stewardship, Case Western Reserve University — **Cleveland, OH**
Research Assistant — *01/2024–09/2024*
- Developed a model, in R, to achieve superior performance in predicting near-subsurface temperatures using machine learning.
- Co-authored manuscripts published at *Scientific Reports* and *Scientific Data* and under review at *JOSS*.
- Published an R package for ontology visualization and semantic data integration on CRAN, achieving over 2,500 downloads/month.
- Designed and taught a one-week R programming course to 30+ attendees.

Center for Materials Data Science for Stockpile Stewardship, Case Western Reserve University — **Cleveland, OH**
Research Assistant — *05/2023–08/2023*
- Published the 'klovan' geostatistics R package on CRAN; provided tools for visualization and analysis.
- Developed a variable optimization algorithm, in R, for the netSEM (Network Structural Equation Modeling) software package.
- Collected lab data on acrylics using a Fluorescence Spectrophotometer and a Micro Indenter.

Projects

- **Representation Theory:** Applying machine learning to uncover generative rules for exceptional sequences. (In Progress).
- **Adversarial ML:** Investigated data poisoning via feature collision attacks and developed an improved method.
- **GPR:** Designed and built a GPR system for subsurface detection of tunnels utilizing geospatial data analysis.

Skills

- **Programming:** Proficient in R and Python; working knowledge of Java.
- **Machine Learning:** Strong foundation in deep learning theory, adversarial robustness, and representation learning.
- **Data Analysis:** Skilled in regression, classification, and time series modeling, data cleaning, integrations, and visualization.
- **Macro-Fab:** Proficient with CNCs, mills, lathes, laser cutters, 3D printers, and standard hand tools.
- **Nano-Fab:** Experienced with photolithography, deposition, sputtering, lift-off, and etching for device fabrication.
- **CAD and Design:** Proficient in SolidWorks, with over 5 years of design experience, and klayout.

Publications

- **Gordon, J.E.**, Akanbi, O.D., et al. Geospatial modeling of near subsurface temperatures of the contiguous United States for assessment of materials degradation. Sci Rep 15, 1053 (2025).
- Rajamohan, B.P., Bradley, A.C.H., Tran, V.D., **Gordon, J. E.** et al. Materials Data Science Ontology (MDS-Onto): Unifying Domain Knowledge in Materials and Applied Data Science. Sci Data 12, 628 (2025).
- Harding Bradley, A., **Gordon, J. E.**, et al. "FAIRmaterials: Ontology Tools with Data FAIRification in Development." *Journal of Open Source Software*, under review.