

Tyler Sinn Jung

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EDUCATION

University of California, Berkeley

Electrical Engineering and Computer Science (EECS) and Physics

Berkeley, CA

GPA: 3.8/4.0

Relevant Coursework: Signals/Dynamical Systems/Information Processing, Circuits and Devices, Experimental Physics (Circuits/Electronics, Optics/Lasers), Linear Algebra, Differential Equations and Fourier Methods, Honors Mechanics and Relativity, Honors Electromagnetism and Optics, Honors Thermodynamics and Quantum Mechanics, Multivariable and Vector Calculus, Foundations of Data Science, Principles and Techniques of Data Science, Computational Structures, Data Structures

SKILLS/INTERESTS

Hardware: Circuit Design and Analysis (LTspice, Multisim), Embedded Systems (Arduino/Raspberry Pi), PCB Design, eCAD, CAD, Oscilloscopes/Function Generators/Digital Multimeters, Spectrum Analyzers, Microprocessors/Microcontrollers

Software: MATLAB, Python (and associated libraries), SQL, HTML/CSS/Javascript/React, MS Suite, Java, LaTeX, Git/Github, C++

WORK EXPERIENCE

BLCK UNICRN - Data Science Intern

May 2024 - August 2024

- Leveraged market research to enhance BLCK UNICRN's financial models, adjusting growth trajectories to align with a 50-75% start-up market CAGR, and strategically reallocating over **\$30,000** in capital to high-priority product development
- Utilized Google Maps, Geocoder APIs, and web scraping tools (Python, BeautifulSoup, Selenium, Scrapy, etc.) to collect, analyze, and visualize data for potential partnerships, future locations, and artist communities. Developed models to highlight favorable factors, identify key prospects, and support a data-driven outreach strategy, enhancing BLCK UNICRN's artist network and growth initiatives
- Conducted a market analysis to define TAM, SAM, and SOM for virtual immersive music experiences, aggregating data from financial sources, performing competitive benchmarking and identifying growth drivers, leading to a strategic and detailed financial report
- Optimized BLCK UNICRN's front end applications for improved fan and creator engagement using HTML/CSS/Javascript

University at Albany, RNA Institute, Lee Lab- Research Intern

June 2022 - December 2022

- Researched the nematode *c. Elegans* for RNA transcription and cell-cell signaling pathways
- Quantified, analyzed, and interpreted RNA transcription active site data through live imaging, processing over **10,000** images to extract crucial datasets on transcription activity and to identify patterns in gene expression dynamics in *c. Elegans*
- Performed wet-lab tasks including maintaining over **100** specimens weekly to cultivate the nematodes' life cycles, preparing **200+** microscopy slides for live and fixed imaging, and conducting **50+** gel electrophoresis experiments to ensure experimental reliability
- Co-authored the research article, *Aging disrupts spatiotemporal regulation of germline stem cells and niche integrity* (accepted at *Biology Open*)

PROJECTS/PUBLICATIONS

Lily Pad Plunge

- Developed an arcade-style game where users aim a frog onto moving pads, combining mechanical, electrical, and software systems
- Implemented game logic (C++) using an **Arduino Mega** and integrated it with mechanical and electrical systems, such as a gantry, pulley, and LCD. Ensured interactive buttons and magnets reflected functional physical input systems and dynamic LCD game visuals
- Engineered a custom circuitry system to power and control game components, designing precise material dimensions through **CAD** for wood and **3D-printed parts**. Utilized **eCAD** tools to prototype and test iterations of the electrical system for optimal performance
- Supplemented project with a website detailing progress and functionality. Programmed using HTML, CSS, and Javascript (React)

The Magnetic Harmonic Oscillator

- Bridged theoretical models and experimental validation by **designing and constructing a magnetic harmonic oscillator** and coil-based system, processing thousands of data points and improving experimental accuracy
- Applied physical principles such as electromagnetic induction and implemented circuit design to optimize the experimental apparatus, minimizing measurement error to **less than 0.1%** across all experiments, confirmed through error propagation
- Applied **predictive modeling** to analyze discrepancies between experimental and theoretical results, gaining insights into electromagnetic behavior. Used **Python, SciPy, Pandas**, and other libraries for optimizing fitting and improving prediction accuracy

Aging disrupts spatiotemporal regulation of germline stem cells and niche integrity

- Identified a significant decline in *c. Elegans* germline fecundity beginning in early adulthood due to disruption in Notch signaling regulation and age-related structural and morphological changes in the DTC/niche, linking niche aging to stem cell regulation and germline tissue function
- Created and analyzed data and visualizations on DTC using **MATLAB**, particularly on active RNA transcription sites. Explored using fluorescent and live imaging microscopes

ORGANIZATIONS

- Quantum Computing at Berkeley, Error Corrections Subcommittee-** Presents and researches quantum error correction methods, analyzes viability of erasure conversion schemes in systems with metastable states of trapped ions; presented to **over 100** students, professors, post-docs, and industry professionals. Develops simulations for quantum error correction models
- Big Data at Berkeley, Bootcamp Instructor-** Develops a comprehensive Data Science curriculum for high school students and teaches extensively through pedagogical methods. Course content includes simulations, machine learning, and classifier models