

# Philip Suh

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## EDUCATION

### Stanford University

Stanford, CA

B.S. in Computer Science, GPA: 3.98

Sep. 2023 – Jun. 2027

Relevant Coursework: Data Structures & Algorithms, Systems, Networking, Machine Learning, Probability Theory

## EXPERIENCE

### Software Developer Intern

May 2024 – Present

Stanford Shen Laboratory

Stanford, CA

- Designed and evaluated multiple models for automated scanning in microwave impedance microscopy using Python (scikit-image, OpenCV, PyTorch), integrating particle-filter and CNN-based approaches to improve localization accuracy by 40% and enhance automated positioning reliability.
- Implemented a particle filter localization pipeline using Python (pyspm, pandas), reducing manual scanning time by 1–4 days (90% improvement) per experiment.
- Developed a modular PyQt5 GUI integrating data processing and image visualization components, streamlining microscopy workflows and increasing throughput for a lab of 15+ researchers.

### Data Science Intern

Jun. 2024 – Sep. 2024

Kavli Institute for Particle Astrophysics and Cosmology

Stanford, CA

- Analyzed 10,000+ luminosity samples (SDSS, Fermi-LAT, VLBI) using non-parametric statistical modeling in Python (NumPy, SciPy, Pandas, Astropy) to identify cross-band feature correlations across astrophysical sources.
- Programmed and executed correlation analyses (Kendall's  $\tau$ , Pearson) on radio–gamma luminosity data, revealing stronger cross-band relationships ( $PCC = 0.53$ ) than radio–optical ( $PCC = 0.40$ ).

### Machine Learning Intern

Dec. 2023 – Jun. 2024

SLAC National Laboratory

Menlo Park, CA

- Benchmarked a proprietary permutation-invariant anomaly detection model in Python (scikit-learn) for identifying beyond-the-standard model particle tracking signatures across  $> 10^6$  simulated events.
- Evaluated model performance against the supervised Particle Flow Network baselines, achieving  $AUC = 0.98$ .
- Investigated oversampling artifacts in pile-up simulation data that caused model performance to collapse ( $AUC = 0.49$ ), prompting collection of higher statistics data.

## PROJECTS

### Counterwatch | Next.js, TypeScript, PostgreSQL, TensorFlow, XGBoost

Jun. 2025 – Present

- Built a hierarchical esports analytics platform for Overwatch 2 integrating web, data, and ML layers.
- Optimized PostgreSQL schema and ETL pipeline for 17k+ data points per game, cutting analysis time by 70%.
- Built time-series aggregation, caching, and ML insights (XGBoost/TensorFlow) for matchup dashboards.

### Poker Sync | React, Vite, Gemini API, ElevenLabs, JavaScript, Python, Flask

Apr. 2025

- 3rd Place – AGI House Google AI Build Weekend Hackathon for developing an AI poker commentator with real-time video analysis and synchronized speech.
- Built a Flask backend using Gemini 2.0 Flash and ElevenLabs, achieving 0-delay playback from 10–15 s lag.
- Developed a React + Vite frontend and cached FFmpeg pipeline for responsive commentary.

### MIM HyperControl GUI | PyQt5, Sci-kit Image, OpenCV, PyVisa, Matplotlib, Python

Jan. 2025 – Oct. 2025

- Built a modular PyQt5 GUI integrating 5+ control modules (MIM, Temperature, Magnet, Helium, Experiment) into a unified, real-time hardware control interface.
- Implemented a Bayesian particle filter (7.5k+ particles) for automated, confidence-weighted scanner navigation.
- Optimized 100 ms real-time visualization with pyqtgraph streaming and matplotlib (Qt5Agg) for embedded plots.

## TECHNICAL SKILLS

**Languages:** Python, JavaScript/TypeScript, Java, C++, C, SQL, HTML, CSS

**Frameworks/Libraries:** React, Next.js, PyQt5, TensorFlow, PyTorch, XGBoost, scikit-learn, OpenCV, Pandas

**Developer Tools:** PostgreSQL, Git, Jupyter, Conda, Vite, FFmpeg, Bash, Docker