Gavin Onghai

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SKILLS

- *Languages:* Python (NumPy, Pandas, Matplotlib, scikit-learn), C, C++, JavaScript, HTML/CSS, Verilog, Typescript
- *Tools and Systems:* Windows, Linux, Xilinx Vivado, VS Code, Git, Bash/Shell, Node.js, React, TailwindCSS
- *Skills:* Data Structures & Algorithms, Object-Oriented Programming, FPGA Programming & Simulation

EDUCATION

Yale University, New Haven, CT — Expected Graduation 2027

- *BS in* **Electrical Engineering and Computer Science***, Certificate in* **Data Science**, **GPA 3.72/4.00**
- **Hahn Scholarship** - **Recognized as one of Yale's top 6 STEM applicants** (6 selected, ~0.01% of 57,517)
- *Relevant Coursework:* Data Structures, Digital Logic & Design, Electronics, Multivariable Calculus, Physics 1 & 2, Proof-based Linear Algebra, Probability Theory
- *Activities: Software Developer* - Yale Computing Society | *Treasurer* – Yale IEEE | *Fellow* - Yale Entrepreneurial Society | *Fellow* - Yale Student Quantitative Finance Organization | *Recruitment Chairman* - Sigma Chi | *Events Coordinator* - Asian-ish

EXPERIENCE

Yale School of Engineering and Applied Science, *Hahn Scholar Researcher*, West Haven, CT — Apr 2025 – Present

- Engineered a lensless imaging system with a Raspberry Pi and reconstructed 2D scenes by applying an object-oriented ADMM algorithm in Python to solve high-dimensional inverse problems.
- Integrated cholesteric liquid crystal films with optical sensors to enable single-shot polarization imaging; used scikit-learn to perform per-pixel regression across 19 waveplate angles and extract Stokes parameters.
- Automated data acquisition using waveplate control scripts and hardware APIs; parsed and structured RGB sensor outputs into NumPy arrays and Pandas data frames for batch processing and analysis.
- Validated system performance by reconstructing known test patterns and visualizing intensity-angle responses using matplotlib, confirming successful ability to determine the degree of polarization.

Yale Computer Society, *Software Developer***,** New Haven**,** CT — Feb 2025 – Present

- Developed and maintained core features for Yale Menus, a full-stack dining mobile app serving 5,000+ monthly users.
- Contributed to the Python-based scraping and API wrapper backend, reducing allergen and meal data delivery latency by ~20% by improving caching and API call efficiency.
- Collaborated with a student engineering team to deploy updates, fix bugs, and ensure great user experiences across IOS/Android.

Simons Summer Research Program, *Research Intern*, Stony Brook, NY — June 2023 – Sept 2023

- Optimized experimental workflows for catalytic nitro-oxidation of cellulose, achieving a 15% yield improvement.
- Applied data analysis and statistical evaluation to compare catalyst performance and ensure reproducibility.

Garcia Summer Research Program, *Research Intern*, Stony Brook, NY — June 2022 – Sept 2022

- Engineered a 3D-printable, conductive, biodegradable filament; Investigated interfacial diffusion behavior between polystyrene and graphene nanoplatelets.
- Created Python scripts interfacing with the LulzBot 3D printer API to test and validate filament performance.
- Automated data collection and analysis pipelines using matplotlib to model diffusion behavior of graphene nanoplatelets.
- **Publication:** *Determination of the interfacial energy between graphene nanoplatelets and deuterated or hydrogenated polystyrene,* ACS Macromolecules (Yu-Chung Lin, Xiaoyang Liu, **Gavin Onghai**, et al.).

PROJECTS

MIPS Processor with Memory-Mapped I/O, *ECE 2011 Lab Project,* **Xilinx Vivado, Verilog** — Apr 2025

- Built and deployed a single-cycle MIPS processor in Verilog with memory-mapped I/O on a Basys 3 FPGA; demonstrated a crawling snake animation via 7-segment LEDs and earned a perfect score on the lab final.
- Resolved a lab-wide issue by teaching classmates how to convert assembly files into Vivado-compatible hex files, enabling successful FPGA programming across the course.

ImprovEdge Extension, Productivity Dashboard Extension, **React JS, HTML/CSS** — May 2025

- Developed a Chrome extension that replaces the default new-tab page with a customizable productivity dashboard.
- Designed a settings system for user customization (theme, widgets, layout), increasing session utility and personalization.
- Integrated APIs for weather, quotes, and task-tracking; optimized API calls with async functions to reduce load time by ~30%.

LEADERSHIP EXPERIENCE

Mission Toothbrush 501(c)(3), *Vice President*, Greater Long Island, New York — Aug 2023 – Aug 2024

- Led donation drives and managed operations for a nonprofit distributing $70,000+ in hygiene supplies; oversaw logistics and volunteer coordination for 20+ volunteers; **Designed and developed a website**, increasing web traffic and outreach by ~10%.

Cedar Hill Cemetery, *Groundskeeper & Pallbearer,* Port Jefferson, NY — June 2023 – Aug 2024

- Assisted in 40+ funeral & burial services, providing support to families during moments of intense grief and emotional hardship.