

# Gavin Onghai

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## SUMMARY

Yale sophomore in Electrical Engineering & Computer Science (Certificate in Data Science) with a strong foundation in scientific computing and hardware–software integration, and experience in full-stack development and computational imaging research.

## EDUCATION

### Yale University, New Haven, CT

Expected Graduation 2028

- **BS in Electrical Engineering and Computer Science, Certificate in Data Science | GPA 3.72/4.00**
- *Relevant Coursework:* Data Structures in C | Digital Logic & Design | Multivariable Calculus | Physics 1 & 2
- *Awards:* **Hahn Scholarship – recognized as top 10 STEM research student at Yale** (of 57,000+ applicants to Yale University)
- *Activities:* *Software Developer* - Yale Computing Society | *Fellow* - Yale Entrepreneurial Society | *Fellow* - Yale Student Quantitative Finance Organization | *Recruitment Chairman* - Sigma Chi | *Events Coordinator* - Asian-ish Club

### Earl L. Vandermeulen High School, Port Jefferson, NY

2024

- **GPA: 101.54/100 | SAT: 780M, 750EBRW | AP Scholar w. Distinction, 17 APs, 13 scores of 5**
- *Awards:* National Honor Society Scholarship (Top 3.5% nationwide) | Suffolk County Outstanding Senior Science Student |
- *Activities:* *Founder* - Chemistry Olympiad Club | *President* - Science Olympiad (18x Medalist) | *President* - National Honor Soc.

## RESEARCH 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.

### Simons Summer Research Program, Research Intern, Stony Brook, NY

June 2023 – Sept 2023

- Collaborated with Prof. Ben Hsiao to investigate the catalytic effects of metal oxides on nitro-oxidation of cellulose; synthesized & characterized nanocellulose samples, achieving 15% improvement in yield via catalyst optimization.

### 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.
- **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

### Yale Computer Society, Software Developer, New Haven, CT

Feb 2025 – Present

- Assisting in development and maintenance of key features for Yale Menus, a full-stack dining application (5,000 monthly users).
- Contributing to the Python-based scraping and API wrapper backend, ensuring delivery of allergen and meal data.

### MIPS Processor with Memory-Mapped I/O, ECE 2011 – Computer Engineering

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 final lab practical.
- Resolved a lab-wide issue by converting snake\_patterns.asm into Vivado-compatible hex files (insmem\_h.txt, datamem\_h.txt), enabling successful FPGA programming for the entire class and received extra credit recognition as a result.

## 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.

## TECHNICAL SKILLS

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