

# Aidan Cusa

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## EDUCATION

### The Cooper Union for the Advancement of Science and Art

- *Joint Bachelor's and Master's of Engineering* in Electrical Engineering Expected Graduation **May 2026**
- *Minor* in Computer Science
- Cumulative GPA: 3.81 | Major GPA: 4.00 | Master's GPA: 4.00
- Full-Tuition Scholarship, Innovator Award
- Tau Beta Pi (Engineering Honor Society – within the top 15 students of the School of Engineering '26 class)
- Eta Kappa Nu (Electrical Engineering Honor Society – within the top 5 students of the EE'26 class)

### Relevant Coursework

Deep Learning, Frequentist, Bayesian, and Generative Machine Learning, Natural Language Processing, Experimentation with PyTorch, Ethics of AI, Compilers, Operating Systems, Data Structures and Algorithms I & II, Software Engineering

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## TECHNICAL SKILLS

**Programming Languages:** Python, SQL, C, C++, MATLAB, Java, Javascript, React, HTML5, CSS, Verilog, x86-32

**Tools:** Git, Docker, MLFlow, BigQuery, DBeaver, Tableau, Google Analytics & Looker, Linux, Microsoft 365 Suite

**Libraries:** JAX, PyTorch, TensorFlow, Pandas, NumPy, SciKit, XGBoost, NLTK, spaCy

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## WORK EXPERIENCE

### National University of Singapore - *Research Intern*

**May - July 2025**

- Designed middleware that wirelessly converts “go-to-floor” commands from any ROS-enabled robot to physical elevator-button presses, letting robots call, ride, and exit lifts without tapping the controller or building network.
- Modeled a slim 7-story panel in OnShape (2.8k+ iterations), built the drive electronics, and designed the LoRa communication protocol, producing a manufacturable design for less than \$75.

### High 5 Games - *Data Science Intern*

**Jun. - Aug. 2024**

- Engineered 50+ custom queries using SQL in BigQuery, conducted individual and team investigations, and used Google Looker to visualize insights and aid in data-driven decision-making.
- Resolved six B2B revenue discrepancies totaling \$10,000+ in difference.
- Developed a Google Cloud Function to automate the ingestion and processing of PayPal chargeback events via a webhook and streamed the relevant data into BigQuery to track user data.

### Brooks Lab Computer Center - *Student Manager*

**Sep. 2023 - Present**

- Co-manage a team of 15 student workers, creating hourly schedules and assisting with their duties.
- Resolve IT problems and install new software to ensure a productive academic environment for staff and students.

### Monroe Public Schools - *Substitute Teacher*

**Jan. 2023 - Present**

- Instruct mathematics, physics, and programming subjects to classes of 25+ elementary and high school students.

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## SELECTED PROJECTS

**Sparse Autoencoder Feature Analysis** (Nov. 2025) - Trained an L1-regularized, overcomplete sparse autoencoder on frozen MLP latent activations, isolating 49 active features and validating their impact through feature-level interventions.

**Caption Verifier** (Apr. - Jun. 2025) - Designed a multimodal caption-verification model that fuses ViT image features with BERT text embeddings, fine-tuned on Flickr30k data to 86.5% accuracy and validated with a custom benchmark.

**C-99 Compiler** (Jan. - May 2025) - Built a C99-compliant compiler with Flex/Bison that transforms source code into quad-based IR and emits runnable x86-32 assembly for Linux environments.

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## EXTRACURRICULAR ACTIVITIES

- Cooper Union International Collegiate Programming Contest (ICPC), Team A Sep. 2024 - Present
- Cooper Union Google Student Developer Club, Member Jan. 2023 - Present
- Institute of Electrical and Electronics Engineers (IEEE), HKN Member Sep. 2022 - Present
- Cooper Badminton Club, Member Sep. 2022 - Present

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**Additional Interests:** Brewing Tea, Knitting, Playing Music (Guitar, Drums, Piano), Chess, and Solving Rubik's Cubes