

Donovan Crowley

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Education

Case Western Reserve University

Cleveland, OH

B.S.E. in Electrical Engineering & B.S. in Computer Science - GPA: 4.0

Aug. 2024 - May 2028

- Relevant Coursework: Data Structures, Circuits, Logic Design, Discrete Math, Algorithms, Operating Systems, Signals & Systems
- USTFCCCA and All-UAA Academic Honors in Cross Country and Track and Field
- Top 50 Programmer in the 2025 CWRU RFB Programming Competition (featuring 500+ students)

Avon Old Farms, Avon, CT - GPA: 4.2/4.3 (Valedictorian)

Sept. 2020 - May 2024

- Harvard Book Award, AP Scholar with Distinction, Colatella Family Scholarship

Professional Experience

SDLE Undergraduate Researcher (Paid)

2025 - Present

- Conducting machine learning research with faculty and graduate students under NDA involving real-time computer vision model optimization
- Developed 5000+ images in 32x32 format to produce synthetic videos (.gifs) with multiple frames, applying noise and a Gaussian blur to improve model generation
- Fabricated and trained 3D CNNs and RNNs for computer vision analysis using Tensorflow, PyTorch, and Keras, achieving 50% faster model conversion

Projects

VTOL Drone | *ESP32, Raspberry Pi, LiDAR, Electromagnet, OpenCV, C++, Python*

- Designed embedded control and computer vision systems with a Hough Circle Transform detection algorithm using ESP32 and Raspberry Pi architecture for object detection and precise targeting
- Configured Raspberry Pi as a wireless access point for real-time communication between ground station and drone
- Integrated ArUco marker detection for precision landing and payload capture, optimizing autonomy
- Built 6 custom PCB motor controllers interfaced with Pixhawk flight controller for stable autonomous flight
- Team placed **1st** at the 2025 VFS Design-Build-Vertical-Flight Competition

Web Scraper | *Puppeteer, Cheerio, Axios, Node.js, Python*

- Developed a web scraper to extract data from multiple APIs
- Used transformer-based NLP embeddings built on Hugging Face to calculate cosine similarities of Wikipedia page links, finding the shortest path between unrelated topics

Object Detection | *OpenCV, C++*

- Built a real-time object tracking program using Hough Circle Transform and HSV-based segmentation to detect and follow moving circular targets
- Incorporated a tracking mode to visualize the object's path with dynamic path resets on command input

Photo Text Collage | *OpenCV, LibZip, K-Means, C++*

- Engineered Object-Oriented program that generates photo collages based on custom ASCII input maps
- Implemented K-Means clustering (K=2) to dynamically divide image datasets based on dominant color vectors, ensuring visual separation between foreground and background groups for text and background contrast
- Developed stream-based pipeline using libzip to decode compressed image archives into RAM, eliminating disk I/O and reducing processing latency

Electric Vehicle + Data Monitor | *Multimeter, Autodesk Fusion 360*

- Redesigned and optimized the electrical circuit to increase system reliability and measurement precision
- Incorporated a custom speedometer and battery voltage monitor, improving electrical efficiency and runtime by 20%
- Team placed **3rd** at the Lime Rock Park Electrathon Competition

Skills

Programming Languages: Python, C++, C, Java, Node.js, TensorFlow, Typescript, HTML, CSS, JavaScript, MATLAB, Arduino

Software: Raspberry Pi OS, Linux/Unix environments, Git, VS Code, Autodesk Fusion 360, Origin, SolidWorks