# Charles Hodgins

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## EDUCATION

**Master of Science in Electrical and Computer Engineering** *Expected May 2026*
*Binghamton University, State University of New York*
**Bachelor of Science in Computer Engineering** *May 2025*
B*inghamton University, State University of New York*
**Cumulative GPA**: 3.54/4.00
**Relevant Coursework**: Digital Systems Design, Data Structures and Algorithms, Operating Systems, Machine Learning, Neural Networks and Deep Learning, Detection Theory

## TECHNICAL SKILLS

**Programming:** Python (pandas, scikit-learn, pytorch), C/C++, JavaScript(Node.js, React.js), Bash, Matlab
**Development Tools:** Git/Github, Linux Os, Windows, Visual Studio, Arduino

## PROFESSIONAL EXPERIENCE

**Software Engineer Consultant - Autonomous Race Car,** *Lockheed Martin* | Vestal, NY *August 2024 - May 2025*
- Achieved 8+ feet/s autonomous navigation by developing separate pytorch perception models including a camera CNN for tape-track following and a LiDAR model for walled-course navigation, running ROS2 on an NVIDIA Jetson Orin Nano
- Engineered ROS2 data pipeline that automated collection and labeling of 200,000+ image/LiDAR training samples, enabling machine learning model deployment
- Successfully completed over 20 autonomous laps without leaving the track at design exposition demonstration

**Research Intern,** *Binghamton University* | Vestal, NY *April 2024 - August 2024*
- Designed a system to rapidly collect 3-channel accelerometer data, enabling real-time motion analysis
- Programmed a custom Arduino script that enabled microcontrollers to transmit precise PWM signals from RC car motors, automating the collection of training data for remote autonomous control of racing robot

**Undergraduate Course Assistant,** *Binghamton University* | Vestal, NY *January 2024 - May 2024*
- Assessed and guided students in EECE 287 Sophomore Design, an introductory class in embedded computer systems
- Aided in instructing class of more than 120 computer engineering students to reinforce material from lecture and lab
- Conducted student code reviews to over 20% of the class to supply feedback and help students improve coding practices

## PROJECT EXPERIENCE

**Sensor Fingerprinting Digital Forensics** May 2025
- Implemented MATLAB functions for PRNU preprocessing, noise residual extraction, and Fourier-domain cross-correlation, achieving $>10^3$ Peak-to-Correlation Energy (PCE) on 2 true Canon 6D images out of 34 tested.
- Designed automated camera identification pipeline with thresholding (PCE > 60) to reliably attribute images to the Canon 6D sensor and detect cropped/shifted inputs.

**Next.js Portfolio Website** *March 2025*
- Built a responsive fullstack website with Next.js, Supabase and Vercel to showcase engineering projects and streamline professional networking
- Designed interactive UI/UX elements including a lightweight MNIST classifier to increase engagement, and user input to send feedback on website features to the PostgreSQL database
- Structured content to highlight technical depth with direct links to codebases, demos, and technical write-ups

**Metal Detector Embedded System** *April 2024 - May 2024*
- Implemented a comprehensive data processing algorithm for a metal detector system, streamlining magnetic sensor data analysis; quantified the sensor readings with 3 separate metrics
- Created a softcore processor in Xilinx Vivado, and wrote C program to distinguish between different thresholds of magnetic field strength, correctly identifying magnetic field strength with 93% accuracy

## LEADERSHIP & INVOLVEMENT EXPERIENCE

**Binghamton Rover Team** - *Firmware Engineer* *May 2024 - May 2025*
- Created robust software solutions for the university's competition rover project, enhancing system reliability across multiple key functionalities utilized by team engineers.
- Program microcontroller boards to interface subsystems of rover network driven by Dart software on Raspberry Pis

**Binghamton Skate Club -** *Vice-President* *August 2023 - Matt 2025*
- Collaborated with campus services to grow a 250+ member roller sports community for athletes of all skill levels.
- Campaigned to the club university financial committee to secure hundreds of dollars in funding and a designated skating space on campus