

Owen Tharp

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Skills

Programming: Java, Python, C, C++, TypeScript, React

Controls and Embedded: WPIlib, LQR, PID, Teensy, ESP32, ODrive, Raspberry Pi

CAD and Manufacturing: SolidWorks, Onshape, Fusion 360 CAM, CNC machining, FDM printing

Experience

CAD Engineering Intern, Formall Inc. - Clinton, TN

June 2026 - Aug 2026

- Designed an automated twin-sheet plug-assist platform in SolidWorks that carries a 12 ft by 9 ft plastic sheet across an 8 ft bed in 5 seconds each direction
- Replaced a vertical cylinder with a scissor lift after its 22 in stroke exceeded the 14 in height envelope, winning approval from all 3 engineers on the CAD team
- Sized an 8 ft rail-guided base and 10:1 rack-and-pinion drive from calculated mechanism loads, gear geometry, and cylinder travel
- Produced a 70-sheet drawing package covering 65 parts, 95% laser-cut sheet and tube and 5% CNC, nearly all welded
- Cut initial drawing setup from 2-4 hours to 5-10 minutes across 3 verified projects with SolidWorks macros for drawing creation, stock sizing, and E3 callouts, correcting output by hand
- Assembled and calibrated a Modix BIG-60 large-format printer over 40 hours, then validated it with production test prints

Projects

Robot Software, FRC Team 1466 - Controls/Systems Director

2022 - Present

- Led the autonomous stack in WPIlib Java with Choreo trajectories, AprilTag localization, and command-based sequencing
- Scored the autonomous routine in 22 of 25 competition matches while holding pose estimates within 0.05 m and 0.1 rad
- Built a finite-state coordination layer shared by autonomous and driver-controlled routines
- Taught a 5-student programming group using 8 original technical decks and hands-on debugging

Furuta Pendulum

2026

- Achieved autonomous swing-up and sustained upright balance with a model-based LQR controller at 200 Hz
- Derived the dynamic model from CAD mass properties and test logs, then tuned LQR gains against hardware data
- Designed, fabricated, and wired the mechanism around a Teensy 4.1, ODrive S1, encoders, and an aluminum frame
- Built a browser interface over UART for guarded tuning, run control, telemetry, and CSV export

Cisco Hack Camp - Student Mentor

2025 - 2026

- Named top project in both 2025 and 2026, returning the second year as a mentor to a 15-student cohort
- Built Reflex Console on an ESP32 badge with five on-device tests, BLE session transfer, and a browser history dashboard
- Built a bidirectional Morse code translator in C++ with visual, keyboard, and tap input modes over WebSockets

Breast Cancer Image Classifiers

2025

- Reached 99.25% validation accuracy comparing a custom CNN, ResNet18 transfer learning, and a ViT in PyTorch
- Graphed training and validation curves to compare convergence and diagnose overfitting across the three architectures

Education

Webb School of Knoxville - High School Diploma

Expected May 2028

GPA: 4.58 weighted / 4.00 unweighted, ACT: 34

Coursework: Honors Quantum Computing, Honors Drone Technology and Aviation, AP Computer Science A

Honors

- 2025 FIRST Engineering Inspiration Award and 2026 Judges Award with Team 1466; FRC World Championship qualifier
- 1st place, Division C Competitive CAD, Science Olympiad; 3rd place, Precalculus/Algebra II, TMTA Mathematics Competition