

Zachary Hoffman

🌐 zthoffman.com | (610) 507-7219 | ✉ zachhoffman@gmail.com | 🌐 zthoffman | 🌐 zthoffman21

EDUCATION

Liberty University: B.S. Computer Science, Mathematics Minor

Lynchburg, VA

GPA: 4.0

Aug. 2022 – May 2026

Relevant classes: Data Structures and Algorithms, Advanced C++, Discrete Math, Calculus III, Matrix and Linear Algebra, Database Design and Management

EXPERIENCE

SAVOYE North America

King of Prussia, PA

Software Engineering Intern

May 2025 – Present

- Built and updated **TCP interfaces** with third-party systems in Java 17/Spring Boot 3 and coordinated internal events via Kafka, improving cross-system reliability and state consistency
- Implemented **single sign-on (SAML/OIDC)** with Spring Security and Keycloak and transitioned the solution into **Dockerized** production builds, standardizing secure access across services and environments
- Developed **industrial-control (PLC) simulators** in Java with an event-driven, nonblocking architecture and fault/latency injection, enabling full-flow, production-like testing
- Delivered real-time, end-to-end features with **React/TypeScript** front end and a backend of **15 Spring Boot microservices**, pushing live equipment data over WebSockets and persisting to MongoDB/Neo4j in a multi-service architecture

Liberty University

Lynchburg, VA

Competitive Programming Club

Aug. 2022 – Present

- Placed **2nd** in the **2023 ACM ICPC Div. II Mid-Atlantic Region**, utilizing algorithms such as dynamic programming, greedy algorithms, and graph traversal (DFS/BFS)
- Collaborated in a team environment to solve advanced algorithmic challenges under timed conditions

French Creek Golf Club

Elverson, PA

Bagroom Attendant

Aug. 2020 – Aug. 2024

- Led a team of **5** employees, utilizing **communication** and **leadership** skills to maintain smooth daily operations, delivering high-quality customer service to 100+ golfers daily, ensuring prompt assistance and issue resolution

PROJECTS

Chess Robot 📄 | *Python, OpenCV, PyTorch, Fusion 360*

Nov. 2024 – Present

- Designed and 3D-printed a 20-inch articulated robotic arm using Autodesk Fusion 360, optimized for precise chess piece manipulation
- Developed a real-time **computer vision** system on a Raspberry Pi 4B with a Pi AI Camera, implementing OpenCV for board detection and a PyTorch-based **neural network** for piece classification
- Implementing motion control through PCA9685 PWM driver interfacing with high-torque 270° metal gear servos (40KG-60KG), utilizing inverse kinematics for accurate piece movement and placement

Machine Learning Racing Simulation 📄 | *Python, NEAT-Python*

Oct. 2024

- Developed a machine learning model using NEAT (NeuroEvolution of Augmenting Topologies) to optimize vehicle behavior, achieving **96%** of the fastest lap time in under 25 generations
- Built a robust **custom physics engine** that models 10 key vehicle dynamics (e.g., wheelbase, traction, downforce) to accurately simulate real-world driving conditions and improve race performance
- Created an interactive simulation using Pygame and Tkinter, enabling real-time track creation, vehicle adjustments, and live **AI performance visualization** to showcase dynamic optimization results

TECHNICAL SKILLS

Languages: Java, Python, C++, TypeScript, SQL, JavaScript, CSS, HTML

Frameworks/Tools: Spring Boot, React, Kafka, MongoDB, Neo4j, Keycloak, Docker, Git, OpenCV, PyTorch, Arduino

Software: Linux, SQL Server Management Studio, Mathematica, Autodesk Fusion, ER Assistant