Patrick Halim

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EDUCATION

University of Michigan — Ann Arbor, MI | May 2025

B.S. Computer Science

- GPA: 4.0/4.0
- Coursework: Data Structures and Algorithms, Machine Learning, Foundations of Computer Science, Discrete Mathematics, Computer Organization, Linear Algebra, XR Development Capstone, Computer Science Pragmatics

EXPERIENCE

BOSCH | Software Engineer Intern — Plymouth, MI | May 2022 - Aug 2022, May 2023 - Present

- Building a WebSocket pipeline from Raspberry Pi to Python to achieve real-time car sensor visualizations for production SW, leveraging C++, Python, Conan, Docker, Bash, and CMake.
- Developed a sleek and efficient automation GUI to flash SW to Bosch microcontrollers, resulting in 4x increased vehicle testing capacity; utilized Python, Tkinter, Bash, and microcontroller-specific CLI.
- Investigated and tested 6 years' worth of SW binaries utilizing a Bosch debugging IDE, CAN bus simulator, and hex viewer to uncover cybersecurity module incompatibilities that caused microcontroller flashing errors.
- Initiated a team-wide project to overhaul the onboarding process, resulting in 3 new onboarding guides.

NASA, CLAWS-UM | President, Software Development Lead — Ann Arbor, MI | Sept 2021 - Present

- Led a 60-member development team selected by NASA to develop 2 full augmented reality projects for astronaut exploration, using a scrum-of-scrums workflow to manage 5 cross-functional teams (video, video).
- Designed, developed, and tested 15 unique AR screens for lunar pathfinding, mission task list, vitals tracking, emergency rescue, and astronaut messaging with Unity Engine (C#) and Microsoft MRTK.
- Pioneered a complete-system state machine utilizing a publisher-subscriber event system to enable context-aware voice command processing for over 70 voice commands and to support smoother and more efficient UI navigation.
- Built foundation of back end to support 16 AR developers by designing the software architecture, creating a clear back-end interface with singleton pattern, and establishing telemetry stream connectivity via WebSockets.

PROJECTS

EXERCISE MOBILE APP — C#, Unity Engine, AR Foundation, GitHub, Blender, Shogun

- A polished Android/iOS app to teach proper exercise form via augmented reality and 3D motion capture. Created by 5 developers in 4 weeks and presented at the XR at Michigan Summit.
- Personally implemented whole app UI, exercise database back end, persistent user data storage, favorites feature, and exercise info screens.

DOG BREED ML CLASSIFIER — Python, PyTorch, NumPy, Jupyter Notebook

- A 3-layer convolutional neural network constructed with PyTorch, including freeze layers, data augmentation, and transfer learning to classify 6 dog breeds with 80% accuracy.

LINKEDIN FOR FOODIES — React, Redux, Firebase, JavaScript, HTML, Tailwind CSS

- A stylish, mobile-responsive social media web app based on the LinkedIn UI built in 5 days. Utilized Firebase Auth for user authentication and a NoSQL database for persistent data storage of users and messages.

PIANO LEARNING APP — Python, Tkinter, Pygame, Mido

- A piano app based on Simply Piano to teach beginners notes and rhythm. Incorporated scrolling sheet music display, virtual piano simulation, audio feedback, song database, and midi file processing via a self-created Python library.

SKILLS

Skills: C, C++, C#, Python, Java, Bash, R, HTML/CSS, JavaScript, React, Git, Unix, Linux, WSL, Docker, Conan, Unity, Unreal Engine

Knowledge: Software Engineering, Project Management, UX, Agile, CI/CD, DevOps

Soft Skills: Self-Initiative, Leadership, Creativity, Versatility, Curiosity, Desire to Learn, Enthusiasm

Awards: Eagle Scout, Cisco Design Competition 1st Place