

Bailey Helfer

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Professional Experience

Lead/Senior Software Engineer

USS Vision, Livonia, MI

June 2024-Present

- Lead software development team, overseeing project architecture, code reviews, and mentoring junior developers.
- Manage project timelines, task prioritization, and resource allocation to meet customer deadlines.
- Act as the primary technical interface with customers across 4 major automotive brands, gathering requirements, providing updates, and delivering solutions.
- Direct the development of 10+ scalable, containerized vision systems deployed across multiple manufacturing plants.
- Lead the design and deployment of AI and machine learning models for real-time vision applications.
- Ensure code quality and maintainability by enforcing best practices, software testing protocols, and agile methodologies.

Software Engineer

USS Vision, Livonia, MI

April 2021-June 2024

- Created custom computer vision applications using Python and a wide range of libraries.
- Administered 10+ PostgreSQL databases with cloud and local VM replication, integrated with Apache Superset for analytics.
- Developed and deployed tailor-made AI and machine learning models for machine vision.
- Engineered backend development, implementing software design patterns for maintainable, scalable applications.
- Built custom HMIs and customer management interfaces using React for Linux and Windows environments, as well as cross-platform applications with native web technologies and Flutter/Dart.

Education

Bachelor of Science in Computer and Information Science

University of Michigan-Dearborn

September 2018-December 2022

- Concentration: Computer Science

Academic Awards:

- Best in Department Award (Computer and Information Science) for VR Wheelchair Soccer
- Alumni Advisory Innovation Award (Third Place) for VR Wheelchair Soccer

Projects

Split Detection System

- Developed a real-time split detection system for sheet metal panels, achieving $\geq 98\%$ accuracy KPI and processing 90-120 images per second from 12MP-25MP GigE cameras.
- Created an intuitive front-end Human Machine Interface (HMI) to provide a user-friendly interaction with the split detection system.
- Implemented a comprehensive data analytics platform with PostgreSQL and Apache Superset, enabling in-depth analysis and insights into system performance.
- Collaborated closely with customers to understand their requirements and feedback, actively maintaining and improving the split detection system based on user needs.

Client Portal

- Developed a comprehensive web-based management portal for internal and customer use for Split Detection System.
- Built full-stack application using React frontend and Python FastAPI backend, managing PostgreSQL databases with millions of records.
- Implemented comprehensive management suite including: real-time image visualization, quality review workflows, dataset curation tools, system configuration, and AI model administration.
- Architected secure, centralized database replication strategy, consolidating data from multiple systems with role-based access controls and reducing query times by 80%.

VR Wheelchair Soccer

- Developed a VR wheelchair soccer game using Unreal Engine and Oculus Quest 2 as part of senior design capstone.
- Implemented AI player logic to create realistic behaviors and decision-making for computer-controlled players.
- Designed and implemented gameplay mechanics and interactions using Blueprints and C++.
- Collaborated with a team of 4 developers over 9 months, utilizing Jira and Github for project management and version control.

Skills

- Languages: Python, SQL, C++, C#, Java, JavaScript, TypeScript, Dart, HTML, CSS
- Frameworks/Libraries/Engines: Flask, FastAPI, React, Flutter, OpenCV, PyTorch, .NET, Unreal, Unity
- Tools & Technologies: Docker, Jenkins, Harbor, Git, ZeroMQ, Apache Superset, PostgreSQL, Distributed Systems