HENOK WEHIBE

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WORK EXPERIENCE

MicrometreUK

Lead/Full Stack Developer *2022 - Present*

Architected and built MicroANPR.com, a cloud-native, multi-tenant SaaS platform for Automatic Number Plate Recognition (ANPR). Designed API-first architecture supporting parking operators, gated communities, fleet management, and retail car parks. Achieved 97%+ accuracy on UK license plates with flexible deployment options (fully managed, self-hosted, or hybrid edge/cloud).

Built high-performance Go backend with Gin framework for concurrent processing of multiple camera streams.

- Leveraged goroutines to handle thousands of concurrent camera connections with low memory footprint.
- Designed multi-tenant architecture with PostgreSQL, supporting group-based access control and per-tenant isolation.
- Implemented REST API with webhook support for seamless integration with third-party systems.
- Deployed using Docker and Ansible for reproducible, scalable infrastructure with Cloudflare CDN.

Developed Computer Vision pipeline using PaddleDetection and PaddleOCR optimized for UK plates.

- Built image preprocessing pipeline with OpenCV for noise reduction, contrast enhancement, and edge detection.
- Implemented deep learning models supporting all UK plate formats (post-2001, prefix, suffix, dateless).
- Created comprehensive technical documentation and tutorial series on ANPR implementation.

Designed a Python/Flask backend with Redis and a React frontend.

- Integrated the React frontend with Python/Flask backend using RESTful APIs.
- Developed responsive user interface with React, enhancing user experience.

Developed Ansible roles to automate deployment across multiple environments.

- Automated the deployment of the React frontend and Python/Flask backend using Ansible roles, enabling continuous integration and delivery.
- Eliminated manual configuration errors and ensured consistent deployments across all environments.
- Increased system reliability and reduced downtime through automated configuration management with Ansible.

Implemented real-time streaming dashboard with Server-Sent Events (SSE) for instant plate detection updates.

- Built SSE endpoints in Go/Gin for zero-latency push notifications to connected clients.
- Integrated Redis Pub/Sub for broadcasting parking activity updates across distributed instances.
- Developed Next.js frontend dashboard with real-time data visualization and tariff calculation.

Utilized pandas to clean and process ANPR data, removing duplicates, correcting errors, and standardizing formats for subsequent analysis

- Improved the accuracy of ANPR data analysis by cleaning and processing the data with pandas.
- Facilitated data sharing by exporting processed ANPR data to CSV, Excel, and JSON formats using pandas.

Developed cross-platform desktop applications with Electron and mobile apps with Ionic Framework, seamlessly

- Utilized RESTful APIs to enable communication between the Electron/Ionic apps and the Flask backend, facilitating real-time data exchange and ANPR functionality.
- Leveraged Electron and Ionic to create native apps for multiple platforms (Android), expanding the reach of the ANPR service and increasing user accessibility.

Built a low-power SoC IoT camera using an Arduino ESP32, integrating a camera module for video

- Designed the hardware and firmware for a SoC IoT camera using an ESP32 microcontroller, integrating a camera module for video capture and Wi-Fi for network connectivity.
- Leveraged the ESP32's built-in Wi-Fi capabilities to enable wireless video streaming.
- Integrated the camera with a cloud platform for remote access, live streaming, and storage of video footage

Integrated real-time video streaming using FFmpeg and OpenCV into the ANPR system, enabling continuous monitoring and analysis of vehicle traffic.

- Utilized FFmpeg and OpenCV to create a video streaming pipeline that feeds live footage into the ANPR system for immediate number plate recognition
- Leveraged FFmpeg to efficiently encode and stream video data from the ESP32 camera to the ANPR system, minimizing latency and bandwidth consumption

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Projects *2020 - Present*

1. **Browser-Based AI Chat (WebLLM)** - Built a 100% client-side AI chat application using WebLLM and WebGPU with zero server dependencies.
    - Implemented WebGPU for hardware-accelerated AI inference directly in the browser.
    - Demonstrated modern JavaScript and AI/ML integration techniques.
1. **Daily Cashier** - Privacy-first sales management system using WebAssembly and SQLite.
    - Built offline-first application with OPFS (Origin Private File System) for persistent client-side storage.
    - Developed with Next.js and SQLite WASM, requiring zero server dependencies.
1. **RAG Quiz System** - Retrieval-Augmented Generation implementation using Ollama.
    - Integrated embeddings and language models for intelligent question-answering.
    - Built with Python for backend processing and vector storage.
1. **DevOps & Infrastructure Projects**
    - Developed Ansible roles for automated WireGuard VPN deployment and event-driven infrastructure.
    - Configured Kubernetes clusters (kubeadm, Microk8s) with Calico/Flannel networking and Nginx Ingress.
    - Built custom Debian/Linux distributions using Packer for consistent development environments.
    - Set up private Docker Registry and Gitea instances on AWS, Azure, and GCP.
    - Implemented Nginx/HAProxy reverse proxy with SSL termination and Fail2ban security.
    - Created monitoring systems with Monit, Crontab, and Git for configuration tracking.

Freelance/Self Employed
Full Stack Web Developer *2020 - 2022*

Developed e-commerce websites, landing pages, and blogs for clients across various industries.

- Built custom WordPress themes and React/Next.js applications from initial concept to deployment.
- Delivered end-to-end solutions: domain registration, email hosting, SSL certificates, and ongoing maintenance.
- Achieved significant performance improvements using Edge Computing (Cloudflare, Vercel) and code optimization.
- Conducted comprehensive audits for performance, accessibility, and SEO.

Built custom web applications and business tools for small businesses.

- Implemented store locators, interactive maps, and custom features using Google Maps API.
- Configured hosting infrastructure with Nginx, SSL termination, and automated deployments.

TECHNICAL SKILLS

Languages	Go, Python, JavaScript/TypeScript
Frontend	React, Next.js, Astro, Tailwind CSS, Framer Motion
Backend	Gin (Go), Flask, Node.js, Express, REST APIs, SSE
Computer Vision	PaddleDetection, PaddleOCR, PyTorch, TensorFlow, OpenCV
AI/ML	WebLLM, RAG, Ollama, Embeddings
Databases	PostgreSQL, MySQL, Redis, MongoDB, SQLite (WASM)
Cloud Platforms	AWS, Google Cloud Platform, Microsoft Azure, Cloudflare
DevOps	Docker, Ansible, Kubernetes, Nginx, HAProxy
Tools	Git, Packer, Vagrant, FFmpeg

CERTIFICATIONS

FreeCodeCamp	Responsive Web Design
FreeCodeCamp	JavaScript Algorithms and Data Structures

EDUCATION

South Thames College *London, UK*

Diploma	Information Technology
GCSE	Triple Science (Biology, Chemistry, Physics), English, Maths