Yuxuan (Vincent) Ma

217-904-2163 | mayuxuan135@gmail.com | LinkedIn | GitHub | Portfolio

EDUCATION

University of Illinois Urbana-Champaign, *Urbana, IL* — *Aug.2024 - May 2025*
Master of Computer Science — GPA: 4.00/4.00

University of Illinois Urbana-Champaign, *Urbana, IL* — *Aug.2021 - May 2024*
Bachelor of Science in Electrical Engineering, Minor in Computer Science — GPA: 3.65/4.00

INTERNSHIP EXPERIENCE

VisionNav Robotics. — **Lawrenceville, GA**
Project Engineer — *Dec. 2025 - Now*

- Implemented AGV robotics system integration using Python, **Linux**, and ROS2, supporting **3D LiDAR SLAM** deployment with on-site mapping, localization tuning, and multi-sensor calibration across perception and safety stacks.
- Performed **multi-LiDAR calibration** including safety LiDAR and perception LiDAR alignment, external parameter tuning (yaw/pitch), fork height calibration, and precision docking adjustment.
- Configured **SICK** safety laser scanners using **Safety Designer** and **Engineering Too**l, defining protective fields and supporting functional safety validation in mixed human–robot environments.
- Developed **PLC–AGV communication** using **Allen-Bradley** Micro820 with **Modbus** TCP / Ethernet, implementing I/O mapping, signal handshaking, and traffic-light control logic under guidance of senior engineers.
- Implemented Bright-Eye vision pipeline based on **YOLO**, contributing to data collection, annotation, model training, and deployment workflow (ONNX → TensorRT) for pallet and reel detection.
- Supported system integration between **RCS scheduler**, Bright-Eye vision server, PLC-controlled wrapper machine, traffic lights, and customer MES to enable automated AGV dispatch and multi-zone task execution.
- Assisted AGV **fleet commissioning** including route configuration, task scheduling, PDA-triggered operations, and real-time coordination between robotics, vision, PLC, and upper-level systems.
- Participated in FMEA-style engineering analysis on heavy-load handling, partial fork insertion, precision stacking, and human–AGV coexistence, contributing mitigation implementations across perception, control, and navigation layers.

3DEX Inc. — **Irvine, CA**
Product Development Engineer — *May. 2025 - Aug. 2025*

- Architected responsive UI components using **Angular (Typescript)** and **Bootstrap**, implementing dynamic form validation, conditional rendering logic, and CSS Grid layouts; fixed legacy responsiveness issues for both mobile and web-based dashboards.
- Refactored 15+ critical components (booking calendar, vendor management tables, real-time analytics charts, modal systems) using **React hooks** and **Redux** for state management, conducted peer code reviews, and enforced coding standards, resulting in 50% reduction in code duplication and 25% improvement in build times
- Designed and implemented **RESTful API** integrations and **WebSocket** connections for real-time data synchronization, handling 200+ concurrent connections for live inventory updates in e-commerce platform and admin operations dashboard.

Horus Intelligence Solutions — **Urbana, IL**
Software Engineering Intern — *Jun. 2022 - Aug. 2022*

- Built scalable data pipeline architecture processing 15K records daily, reducing client insight delivery time from ~40 hours to ~7 hours through optimized ETL workflows and parallel processing implementations.
- Developed robust web scraping framework in **Python** (**BeautifulSoup**, **Scrapy**) with comprehensive error handling and retry logic, successfully extracting and structuring data from 8000+ lines of text.
- Implemented data validation pipeline using **pandas** and **NumPy**, incorporating regex patterns to identify and auto-correct 95% of data inconsistencies before downstream processing.
- Delivered project on time, improved overall data processing efficiency by 10%, reduced scraping error by 30%, and received exceptional customer feedback.
- Implemented comprehensive unit test and integration tests for data scraping and ETL pipelines, ensuring correctness across diverse data sources and achieving >85% test coverage.

RESEARCH & TECHNICAL PROJECTS

Full-Stack AI SaaS Platform with Usage-Based Billing | website — *Aug. 2025 - Oct. 2025*

- Architected and developed a complete multi-tenant **SaaS** platform serving AI workloads with 99.9% uptime **SLA**, supporting 3-tier pricing plans (FREE/PRO/ENTERPRISE) with metered billing for 5M+ tokens per month.
- Implemented secure **API** key management and **authentication** system with bcrypt hashing, **JWT** validation, and 300+ requests/minute rate limiting across 10+ endpoints using **Clerk** OAuth integration with role-based access control.
- Built **asynchronous** job processing pipeline using **BullMQ** and **Redis** with 5 concurrent workers, processing 1000+ AI jobs/hour with exponential backoff retry logic and comprehensive error handling.
- Designed scalable database architecture with **PostgreSQL** and **Prisma ORM** managing 15+ entities including multi-tenant organizations, usage analytics, and audit logging with optimized queries and connection pooling.
- Developed production-ready observability stack using **OpenTelemetry** with distributed tracing, **Prometheus** metrics, and **Grafana** dashboards monitoring p95 latency ≤5s and 99% webhook delivery success rates.
- Created responsive **Next.js** 14 dashboard with real-time analytics, billing integration via **Stripe** API, and comprehensive admin tools, deployed on **Railway** with **Docker** containerization and zero-downtime deployments.