

Xavier Koo

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WORK EXPERIENCE

ASTERISK TECHNOLOGIES

Aug. 2023 – Jan. 2024

Software Engineer

Singapore

- Revamped a major private hospital's visitor management system that oversees over 15,000 visitors using **Flutter**, **Riverpod** and **SQLite**.
- Implemented enhancements to the hospital's facilities management system using **React** and **Express + Node**, generating extra revenue.

ASTERISK TECHNOLOGIES

Feb. 2023 – Aug. 2023

Software Engineer & Machine Learning Intern

Singapore

- Architected single-handedly an organization-wide facilities management system (FMS), enabling a major private hospital client to oversee thousands of bookings, and streamlining admin for 1200+ employees with 0% booking error rate.
- Engineered automated facility access by integrating tablets as interactive facility displays, seamlessly linked to the FMS and facility door relays, allowing automated user access via QR Code/TOTP, achieving a 100% reduction in manual facility access requests by users.
- Spearheaded front-end development with **React**, **Bootstrap**, and **SASS**, building 12 components and 13 mobile-responsive web pages.
- Constructed backend with **Express** and **Node.js**, creating 50 **RESTful APIs** including email integration with SendGrid API. Implemented **MongoDB** with a unified database architecture for brand switching, reducing development time for client deployments.
- Enforced code styling and quality via **ESLint**. Wrote unit, integration, end-to-end tests with **Jest**, **react-testing-library**, and **Cypress**.
- Devised basic **CI/CD** pipeline for build, test, and deployment and authored 3 internal wikis for documentation of system.
- Employed **Electron.js** to package **React** based interactive facility display app for seamless installation on tablets. Utilized **PM2** for a resilient, automatic local server with 99% uptime, ensuring continuous facility operations and security with no disruptions.
- Developed a license plate detection and character recognition tool using **YOLOv7** integrated with **PaddleOCR**. Trained the model using R-CNN on annotated data labelled with **LabelImg**, achieving a mean Average Precision of 90%+.

HACKATHONS & PROJECTS

[HACKATHON] PSA CODE SPRINT 2023 – CHAMPION

TEAM LEADER

<https://github.com/xavierkoo/psa-codesprint-2023>

- Led winning team ByTheSea against 100+ teams by developing an AI-powered next-gen HR platform to enhance PSA's HR strategy in 3 key areas: Talent, Experience & Engagement. Utilized **LangChain**, **ChromaDB**, **Streamlit**, **FastAPI**, **Vue.js**, and **OpenAI API**.

[CLIENT PROJECT] AUTHENTICATION SYSTEM – ASCENDA LOYALTY

DEVELOPER

<https://github.com/xavierkoo/authentication-system>

- Engineered a highly scalable and secure authentication system for the client company with AWS (Cognito, S3, Lambda, CloudFront, Route 53, WAF, API Gateway), and React TypeScript.

[CLIENT PROJECT] FORM MANAGEMENT SYSTEM - QUANTUM LEAP INC.

DEVELOPER

<https://github.com/xavierkoo/leapaheadx>

- Developed an FMS for the client company to digitalize form management processes with **Vue.js/Vite**, **Bootstrap**, **SASS**, **Java Spring Boot**, **Docker** & **MySQL**, adhering to **OOP** principles and employing **UML**, **ERD** & **Use Case Diagrams**.

[PROJECT] GREENVENTURE

DEVELOPER

<https://github.com/xavierkoo/greenventure-main>

- Constructed a web app incentivizing and rewarding users to recycle, utilizing a scalable microservices-based architecture with **React**, **Express.js**, **Node.js**, **MongoDB**, and **Docker** and integrated a messaging system using **AMQP** based **LavinMQ** with **nodemailer**.

EDUCATION

SINGAPORE MANAGEMENT UNIVERSITY

May 2025

Bachelor of Science (Information Systems), Majors (Information Systems & Computer Science - Artificial Intelligence)

- Relevant Coursework:** Data Structures & Algorithms, Object Oriented Programming, IT Solution Architecture (AWS, Systems Design), Software Project Management (Agile/Scrum), Agent-Based Modelling & Simulation (Netlogo)
- Professional Certifications:** Oracle Certified Foundations Associate - Java, AWS Certified Solutions Architect – Associate
- Teaching Assistant:** CS301 – IT Solution Architecture (AWS, Java), IS213 – Enterprise Solution Development (Docker, Flask)

SKILLS

- Languages:** HTML | CSS | SASS | JavaScript | TypeScript | Python | Java | Dart
- Frameworks/Libraries:** React.js | Vue.js | Flutter | Bootstrap | Express.js | Node.js | Electron.js | Spring Boot | Jest | Cypress | Riverpod | FastAPI | LangChain | StreamLit
- Databases/Tools:** MySQL | MongoDB | SQLite | Docker | Amazon Web Services (AWS) | Git | ESLint | AMQP | Vite | Heroku | Netlify | Pm2 | OpenCV | YOLO | PaddleOCR | LabelImg | ChromaDB