Xavier Koo

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WORK EXPERIENCE

ASTERISK TECHNOLOGIES   Aug. 2023 – Present
Software Engineer   *Singapore*
- Deployed an internal device monitoring tool using **React** and **Express + Node,** enabling live remote device status monitoring.
- Spearheaded the software rewrite of a visitor management system for a major private hospital using **Flutter, Riverpod** and **SQLite**.

ASTERISK TECHNOLOGIES   Feb. 2023 – Aug. 2023
Software Engineer & Machine Learning Intern   *Singapore*
- Architected independently 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 reusable components and 13 dynamic and mobile-responsive web pages. Pioneered a one-click CSV data export feature, enhancing user data accessibility.
- 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. User authentication and secure facility access accomplished with **JWTs** and QR/TOTP, generated securely with Network Time Protocol.
- Enforced code styling and quality via **ESLint**. Wrote comprehensive unit, integration, and end-to-end tests with **Jest**, **react-testing-library**, and **Cypress**. Devised basic **CI/CD** pipeline for automated build, test, and deployment. Authored wiki for documentation of system and managed new updates and bug fixes on live system via GitHub releases.
- 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 **YOLOv4** and **Darknet**, subsequently transitioning to **YOLOv7**. Integrated **PaddleOCR** for robust Optical Character Recognition. Trained the model using Region Based Convolutional Neural Networks on annotated data sourced through **LabelImg.** Achieved an impressive mean Average Precision of 90%+.

HACKATHONS & PROJECTS

[HACKATHON CHAMPION] PSA CODE SPRINT 2023   TEAM BYTHESEA
https://github.com/xavierkoo/psa-codesprint-2023
- Led winning team in developing a next-gen HR platform utilizing **LangChain**, **ChromaDB**, **Streamlit**, **FastAPI**, **Vue.js**, and **OpenAI API**; competed against 100+ teams.

[CLIENT PROJECT] FORM MANAGEMENT SYSTEM (FMS)   QUANTUM LEAP INC.
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 – MICROSERVICES-BASED ARCHITECTURE
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** message broker with **nodemailer** for user emails.

EDUCATION

SINGAPORE MANAGEMENT UNIVERSITY   Aug. 2021 – May 2025
Bachelor of Science (Information Systems), Majors (Information Systems & Computer Science)
- Penultimate Undergraduate majoring in Information Systems (Digitalization & Cloud Solutions) and Computer Science (Artificial Intelligence).

LANGUAGES & TECHNOLOGIES

- **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 | AWS| Git | ESLint | AMQP | Vite | Heroku | Netlify | Pm2 | OpenCV | YOLO | PaddleOCR | CSPDarknet53 | LabelImg | ChromaDB