

Koh Jun Kai

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General Information

Nationality: Singaporean

Driven Year 4 Computer Science undergraduate with a strong track record as a Full Stack React Software Developer, backed by 1.5 years of hands-on experience. I will be earning the specialisation requirements in AI, Cybersecurity and Data Science & Analytics. When I work, I am purpose-driven, accountable and sincere. I graduate in May 2024.

Education

Nanyang Technological University, Singapore

Aug 2020 – May 2024

Bachelor of Engineering (Computer Science)

- A.I: (1) Neural Network & Deep Learning (2) Natural Language Processing (3) Machine Learning
- Cyber Security: (1) Computer Security (2) Software Security (3) Cyber Threat Intelligence
- Data Science & Analytics: (1) Data Analytics and Mining (2) Database System Principles (3) Computer Security
- Noteworthy: (1) Blockchain Technology (2) Advanced Software Engineering (3) Multidisciplinary Design Project

Professional Experience

Temasek Laboratories

Part Time NTU Work Study Deep Learning Assistant

1 Oct 2023 – 31 Mar 2023

- Solely responsible for the full-stack development of the project demo.
- Successfully executed the quantized ONNX model on the frontend application using webpack, enabling zero-shot prompting for image segmentation tasks.
- Integrated functions from the Segment Anything repository to generate image embeddings and segmentation predictions on the FastAPI server, enhancing the frontend application's capabilities.
- Implemented data caching on the Python server to optimize load times.
- Currently working on the implementation of file management and labelling functions for the project demo.

Ministry of Home Affairs

9 Jan 2023 – 26 May 2023

Full-Stack Software Developer, Internship

J.A.R.M

- Lead the team in designing the Tech Stack and software architecture for this project.
- Designed and implemented an interactive and extensible dashboard interface using TailwindCSS and React libraries, with customizable widget types, sizes, and layouts.
- Developed diverse widget functions, including interactive maps, social media embeddings, OpenAI Whisper translations and transcriptions, report summary, sentiment analysis, email automation, A.I. email template generation, text-to-speech, and speech-to-text capabilities.
- Enhanced Frontend performance through efficient state management using Zustand, resulting in faster load times.
- Integrated an intelligent chatbot assistant powered by OpenAI's ChatGPT API and Google's BERT. Leveraged intent classification and entity extraction to enable seamless triggering of widget functions and natural conversation with users.
- Set up the Python REST API Flask server which stores data locally on Excel as the backend store.

ChatGPT Webapp

- Sole Developer of the ChatGPT webapp for internal department use, storing user queries for analysis.
- Implemented ChatGPT chatbot clone using OpenAI's API, incorporating the ability to select different versions of ChatGPT for enhanced performance and user experience.
- Utilized Azure's OpenAI API for GPT4 models, staying up-to-date with cutting-edge advancements.
- Ensure CI/CD cloud deployment of webapp on Azure's Static Web App, Azure SQL Server, and Azure SQL Database.
- Initially hosted the app on Firebase with Firestore as backend as well.
- Developed key features, including token management, response regeneration, and real-time data streaming using server-side events.
- Successfully integrated Langchain with Azure OpenAI API, paving the way for further extensions of the webapp's capabilities through the combination of additional models and cutting edge features available within the library.

Learn Systems PTE. LTD

(Part-Time) 2 Jan 2022 – 9 May 2022

Software Developer, Internship

(Full-Time) 9 May 2022 – 8 Aug 2022

- Enhance the UX of the application through redesign of the UI whilst revamping its functionality by refactoring existing app components.
- Improved the responsiveness of the application by incorporating Dexie LiveQuery into the app.

- Created and documented reusable functional components.
- Create and revamp REST API calls using PHP (Laravel) and MySQL in the backend.

Projects

Portfolio Website

Dec 2023 – Current

- <https://react-frontend-production-3e58.up.railway.app/>
- Currently developing and hosting a React portfolio application to showcase past work and experiences.
- Implemented a mobile-friendly responsive UI that can adjust accordingly for mobile devices
- Implemented dark/light theme system.

Dutch Auction on Ethereum Blockchain

Aug 2023 – Nov 2023

- Developed a Web 3.0 React Web application interfacing with a Solidity contract deployed on the Ethereum Hardhat Local Blockchain.
- Utilized web3js and ethersjs to establish connections and facilitate transactions between the frontend React web app and the Dutch Auction Solidity contract on the local Hardhat blockchain.
- Explored the Web3ReactProvider library, simplifying integration with multiple web3 providers concurrently.
- Co-authored a term paper addressing Security, Privacy, and Scalability issues associated with Dutch Auction blockchain implementations. Proposed innovative solutions to mitigate front-running problems.
- Implemented user login and protected routes

Gender Classification Research Project

Aug 2023 – Nov 2023

- Conducted research on various Neural Network techniques for Gender Classification in human images from real-world scenarios.
- Experimented with and compared the efficacy and limitations of Vision Transformers, Basic Convolutional Neural Networks, Transfer Learning Models, and Multi-attribute Neural Networks.
- Enhanced model generalization through techniques such as data augmentation, early stopping, adaptive learning rates, and dropout rate adjustments.
- Innovatively improved model generalization by incorporating face localization techniques, including object detection and image segmentation, to remove background noise from the training data.

Cyber Threat Intelligence Project

Aug 2023 – Nov 2023

- Utilized the Tor network (Onion) for secure and anonymous data gathering while scraping and investigating ransomware postings on the Dark Web using Selenium.
- Conducted threat actor profiling through OSINT techniques, investigating the infrastructure and resources employed by threat actors using tools such as VirusTotal. Further analysis was performed using the MITRE, Diamond model, and TTP frameworks.
- Employed Tableau as a data processing tool to analyze the scraped data, categorize and identify attack patterns, and provide insights into vulnerabilities within specific industries.

PasteBin Clone

Aug 2023 – Nov 2023

- Developed and deployed a cloud-hosted full-stack PasteBin clone using React for the frontend and Express.js with a MySQL database for the backend.
- Implemented CI/CD pipelines with Azure Static Web Apps for frontend hosting, Railway app for Express server hosting, and files.io for database hosting, ensuring seamless deployment and updates.
- Designed a dynamic frontend code block component that performs code highlighting based on the selected programming language.
- Implemented key PasteBin functionalities, including uploading, retrieval, view count tracking, and deletion of code snippets.

User Authentication Toy Project

Aug 2023 – Nov 2023

- Developed and deployed an authentication application using React, Express.js, MongoDB.
- Implemented robust user authentication with JWT (JSON Web Tokens), utilizing access and refresh tokens for secure frontend authentication.

Telegram Bot

Aug 2023 – Nov 2023

- Developed a long-polling Telegram chat bot capable of enabling message "locking" until both parties have sent their messages, enhancing user engagement and interaction.
- Transitioned to a webhook-based telebot using Cloudflare Workers, improving scalability and performance.
- Successfully deployed and transitioned the Telegram bot to the Telegram web app, ensuring seamless functionality with the necessary user data.

NTU Facility Auto Booker

Aug 2023 – Nov 2023

- Developed a python court booker script that uses Selenium to log into accounts and requests library to directly book the courts using the api request itself rather than clicks.
- The application can send the api request at the exact moment the courts are released.
- The terminal-based application is also able to facilitate mass bookings with multiple accounts, reducing the effort required to secure courts for training.

Multi-Disciplinary Project

Aug 2022 – Nov 2022

- Developed an android application that controls a robot via Bluetooth communication using the MVVM design pattern.
- MutableLiveData was used throughout the app to ensure consistent game state throughout different fragments
- Implemented interactive and intuitive UI functionalities such as drag and drop placement of obstacles and drag out to delete.

Advanced Software Engineering Project

Aug 2022 – Nov 2022

- React web application for repurposing leftover ingredients, using Express.js and MySQL for backend.
- It does food inventory tracking and recipe recommendations based on remaining ingredients

Natural Language Processing Project

Aug 2022 – Nov 2022

- Developed a sentiment analysis model to predict comments and posts on the Reddit depression forum.
- Designed as an early warning system to alert admins of potentially suicidal or dangerous emergencies based on extremely negative sentiment analysis results.
- Conducted data crawling using the praw library to collect Reddit forum data.
- Utilized a pretrained BERT model for sentiment classification.
- Implemented a Stacked Ensemble Method to enhance prediction accuracy by leveraging multiple models and increasing robustness to noise.

Data Analytics & Mining Project

Aug 2022 – Nov 2022

- Conducted exploratory analysis and preprocessing of 8 diverse datasets for classification using association rules.
- Developed and applied a Classification based on Association Rules (CBA) algorithm, comparing it to Random Forest and CatBoost models for accuracy.
- Enhanced CBA with AdaBoost to address overfitting, with varying results across datasets, providing insights into the algorithm's suitability for different problem types.

Wumpus World

Jan 2022 – May 2022

- Developed a knowledge-based agent to solve the Wumpus World problem using Prolog to manage the agent and a python program using the PySWIP library to simulate the environment's interactions with the agent.
- Learnt to apply propositional logic and first order logic concepts to a game simulation

SGBikers

Jan 2022 – May 2022

- Developed a flutter application for cyclists to track, create and discover cycling paths, organise and join cycling events as well as provide a social media platform for cyclists to share and review cycling routes and events.
- Used a three-tier system architecture to implement the app
- Conducted white-box and black-box testing on the application

Restaurant Reservation and Point of Sale System

Aug 2021 – Nov 2021

- Developed a Java Console-based application to computerize the processes of making reservation, recording of orders and displaying sale records.
- Made sure application adhered to Object-Oriented Programming concepts.
- Show Class relations using UML class and sequence diagrams.

Predicting Movie Profitability

Jan 2020 – May 2020

- Performed data extraction and pre-processing of 10,000 movie data from TheMovieDB API using the Pandas framework.
- Merged categorical data with numeric data through one-hot encoding, dealing with high cardinality categorical data.
- Performed machine learning using Random Forest Regressor to create a reasonably accurate model that can predict Profitability of Movies given its features.
- Recommend the most important features to focus on to improve profitability through analysis of the feature importance in the Random Forest Regressor model.

Skills and Competencies

Languages: Fluent in English. Conversant Mandarin.

Programming Languages: Java, Javascript (ES6), CSS, PHP, Python, C, Prolog, SQL, C++, Verilog, Dart

Developer Tools: Android Studio, GitHub, Bitbucket, Jira, SourceTree

Frameworks: React.JS, Dexie, Laravel, Pandas, Flutter, PySWIP, Selenium

Cloud Services: Azure Static Web App, Azure Sql Server, Azure Database

Other Skills: Canvas, Final Cut Pro, Youtube Livestream

Extra-Curricular Activities

Hall Six Overseas Volunteering

Aug 2022 – Jun 2023

Main Committee (Teaching)

- Designed and delivered Scratch programming lessons of increasing complexity
- Taught fundamental programming concepts including variables and loops
- Inspired and encouraged students to explore computer science through hands-on game programming
- Collaborated with local construction workers to construct a library serving three communes

Top 4 (Financial Controller)

- Budgeting and forecasting of annual budget, taking into account income, claimable funds and estimated costs.
- Prepare timely and accurate financial reports monthly.
- Collaborate with executive leadership to plan events that can maximise enrichment of our club with justified costs.

Orientation Group Leader

July 2022

- Organised and conducted a 2-day remote freshmen orientation program for NTU Hall 6.
- Developed strong emotional intelligence skills by supporting the emotional well-being of freshmen.

Captain for Othello and Tennis

Jan 2021 – May 2022

- Organise and conduct weekly trainings.
- Create a fulfilling and welcoming environment for club members to learn and improve.
- Coached the team to compete for inter-hall competitions.

NTU Hall of Residence 6 Junior Common Room Committee (JCRC)

Aug 2020 – May 2021

Main Committee (Social Director)

- Planned and executed major hall events for all hall residents (eg. Halloween, Christmas and CNY)
- Navigated strict COVID restrictions to deliver engaging and safe events for residents.
- Pioneered conducting Virtual and Decentralized events in hall 6.
- Refined interpersonal communication skills

Hackathons and Workshops

DSTA BrainHack – CODE_EXP Mobile App Development Hackathon

- Built an app prototype using React Native that enables users to keep abreast of the changing rules and regulations regarding covid, and lets them know what guidelines you need to adhere to for each activity.

Awards and Recognition

- Saints Model United Nations Honourable Mention (2016)
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- Selected to share my E-Portfolio (kohjunkai.weebly.com) with the Talent Development Programme cohort (2017)

Hobbies and Interests

Nanyang Technological University (2020 – Current)

- Inter-varsity Softball Invitationals 3rd
- Tennis Club Rising Stars 2023 Mixed Doubles Champion
- Hall 6 Sports Full Colours Award 2023
- Inter-Hall Games 2023 Tennis Champion
- Inter-Hall Games 2023 Softball Champion
- Inter-Hall Games 2023 Squash Runner-Up
- Inter-Hall Recreational Games 2023 Othello Top 4
- Hall 6 Recreational Captain of the Year 2022
- Hall 6 Recreational Full Colours Award 2022
- Inter-Hall Recreational Games 2022 Othello Top 4
- Hall 6 Recreational Half Colours Award 2021
- Inter-Hall Recreational Games 2021 Othello Top 4

St. Andrews Junior College (2016 - 2017)

- 'A' Division Badminton 2017 Top 8