Ching-Cheong Lee

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ABOUT ME

Graduated from HKUST with an M.Phil degree in Mathematics, worked in both academic and nonacademic fields, with solid knowledge in frontend and backend programming. Passionate about solving problems in my daily life.

EXPERIENCE

Software Engineer

Wonderbricks Limited, Hong Kong

Mid of May 2023 ~ Present [1.08 Years]

| AWS | S3, Cloudfront, Lambda, EC2-loadbalancer, ECS-Fargate, Route53, API-Gateway, RDS |

| Frontend | React, Redux-toolkit, React-Native, React-Native-Reanimated, Next, Expo-CLI, Algolia, Socket.io-client, Push Notification for iOS and Android |

| Backend | Express, Mongoose, Socket.io, Algolia, Googleapis, Nodemailer, Prisma, Prisma-Kysely, Expo Push Notification, PostgreSQL, MongoDB, RabbitMQ, Redis, Kafka with Debezium |

Job Detail

WEB APPLICATION

Frontend.
- Build, revamp and maintain React projects in Typescript

Backend.
- Maintain SpringBoot project, build APIs using MyBatis and mongo-java-driver

MOBILE APPLICATION

Frontend.
- Develop this realtime text-messaging and LLM based project from scratch by React-Native and EXPO
- Create custom interactive components by React-Native-Reanimated
- Use Redux to handle complex data-flow and precisely control components' rerendering

Backend.
- **Database (PostgreSQL + MongoDB).**
  - Design tables in PostgreSQL for our backend to fulfill ever-changing requirements from product manager
  - Decide to use MongoDB to store feedbacks from ChatGPT which is prompt-engineered by AI/Data Team
  - Make careful consideration on the data-type of primary keys. When using UUID, decided to replace the purely random UUID by ULID to improve performance of insertion
  - Migrate schema of PostgreSQL DB via Prisma. Have good experience of creating, resolving, and testing migration scripts in dev and non-dev environments
- **Express Server.**
  - Develop the backend application from scratch using express and socketio, etc
  - Decide to use query builder (Prisma-Kysely) instead of any existing ORMs, making the application readily maintainable by anyone who knows basic SQL
  - Implement jwt authentication and refresh-token mechanism in both frontend and backend
  - Design middleware to let user send text, audio, images via REST apis and broadcast the message via socket.io
  - Develop Push notification system for ios and android
  - Unify the structure of API response so that the frontend can handle errors gracefully
- **Serverless Functions (Excel and Word File Generation).**
  - Develop Lambda function in python that runs a Flask application
  - Develop Lambda function in nodejs that runs an Express application
- **System Design.**
  - Develop message queue system using RabbitMQ to:
    - Rate limit api which has a limit of 100 concurrent calls (azure openai service)
    - Delay actions by means of DeadLetter Queue
  - Develop a class in the above message queue system to organize consumption logic, error-report logic and msg-publishing logic in a type-safe way
  - Develop a caching system (and a class) to GET and SET cached value in a managable way
  - Develop in-app notifcation table to separate user-specific data from our API, making those API cachable (userId independent)

BLOG

PORTFOLIO

https://machingclee.github.io/portfolio

SKILLS

Source Control
- Git

Deployment
- Docker, Github Actions

Cloud (AWS)
- Security Group, Target Group, Load Balancer, ECS Fargate, Route53, S3, CloudFront, Lambda Functions, API-Gateway, RDS, SQS

Typescript
- React, React-Native, Redux, Redux-Saga, Next.js, Electron.js, Electron with Next.js, Node.js, Express.js, Socket.io, Twilio.js, Knex.js, Mongoose.js, Prisma.js, Prisma-Kysely.js

Java
- Spring Boot, JPA, JOOQ

Golang
- Gin, Goose, Sqlc, Azure-sdk for Voice, Go-Jet

Python
- Tensorflow v2, PyTorch, Pandas, Flask, ONNX, Openpyxl, Boto3, Mongoengine, Selenium, Conda

C++
- CMake Ecosystem, Libtorch, OpenCV, ImGui for Desktop App

C#
- Windows Presentation Foundation

Rust
- Implementation of Elliptic Curve Digital Signature Algorithm, Code Explanation and Implementation

Data Streaming/Monitoring
- Kafka with Debezium

Message Broker
- Rabbit MQ

Database Query & Management
- PostgreSQL, MongoDB

Art
- Photoshop CC, 3DS Max, Saola Animate (HTML5 Game)

iOS Deployment to AppStore with EXPO.

- Create Internal Ad-Hoc Distribution
- Create Store Build for publishing to App Store Connect
- Create Internal and External Test via TestFlight
- Handle App Submissions and Rejections
- Manage everything above with 4 stages (DEV, UAT, POC, PROD) with different bundleIdentifier, ascAppId, version and buildNumber, env (EXPO_PUBLIC_XXX's)

DevOps / CICD.

- Create **automated deployment** workflows for frontend and backend via github actions. Which includes:
  - Deployment of containerized application via: [1] push to image registry [2] update task defintion and [3] instruct ECS Serivce to use updated task
  - Deployment of documentation project onto S3 and cache-invalidation of cloudfront
  - Deployment of Serverless Node.js and Flask application for file generation

Other.

- Initiated a google-authenticated documentation project by using Docusaurus to record detail that our developer should know
- Lead, guide and nurture junior programmer by constantly sharing articles, my github projects, and related youtube videos when there are knowledge that they lack of

AI Engineer

15 Aug 2022 ~ April 2023 ^{8.4 Months}

Eye Catching Limited, Hong Kong

Python | PyTorch
Typescript | Tensorflow, Onnx
C++ | Libtorch, Imgui, CMake Ecosystem

Job Detail

- Maintain angular project
- Study eye-tracing related algorithm
- Study and deploy machine leanring algorihtm in web-app and desktop-app
- Completely translate a BlazeFace model in python into the same model in libtorch of C++ for GUI application
- Implement methods to ensure weights in pytorch model can be used in libtorch model
- Study CMake and develop software to combine libtorch model and imgui application

Senior Software Developer

Sep 2021 ~ July 2022 ^{10.9 Months}

RaSpect Intelligence Inspection Limited, Hong Kong

Python | Selenium, Boto3, Mongoengine, gRPC, PyTorch, Tensorflow
Annotation | CVAT, COCO-Annotator
AI-General | Data Annotation, DataLoader with Various Data Augmentations, Model Training for Rust Detection, Model Training for Crack Detection
AI-Models | GAN for Producing Synthetic Data, Faster RCNN from Scratch and its Modification, Single Stage Headless **Face** Detector into **Rust** Detector

Job Detail

WEB RELATED

- Maintain React Next project
- Data scrapping for house transactions records
- Automation on tracking latest rtk-data from official geodetic website and data-processing pipeline
- Work with a local grpc based service in Python to interact with a compiled binary (.exe), messed with multi-threading stuff

OBJECT DETECTION RELATED

- **Text Detection.** Manage to run an open-sourced text detection (EAST) to facilitate signboard defect classification
- **Crack Detection.** Help implement detection model for crack and spalling
- **Rust Detection.** Implemented two solutions: **(i)** Text removal, then classifcation pipeline; and **(ii)** direct object detection model using faster rcnn

IMAGE GENERATION/INPAINTING

- **DefectGAN.** Implemented image-generation model following this paper that generates synthetic data on cracks and spallings for training defect detection models on facades
- **Text Removal.** Experimented with existing algorithms like various GAN or image-inpainting method in pytorch. Finally I follow this paper to obtain a text eraser with satisfactory performance

Software Engineer
Aug 2020 ~ Mid-Aug 2021 [1.03 Years]

EAB Systems (Hong Kong) Limited, Hong Kong

`Typescript` React, Redux, React-Native, Express, Mongoose, Sendgrid, Twilio, socket.io

`Python` Pandas, Tensorflow v2

Job Detail

WEB APPLICATION

- Build video conferencing frontend and backend application in React, Twilio and express
- Build CMS system that lets users create their own single page application

MACHINE LEARNING RELATED

- Build CSV Importer (together with an express layer and a Flask layer) that can parse a csv/excel file and perform:
  - **Data Classification.** Classify column based on existing data using LSTM model with two dense layers and finally a softmax (sample code)
  - **Auto Date-reformatting.** Based on machine learning model (transformer in NLP) that can translate all common form of date into YYYY-MM-DD format (sample code)

Front-end Developer
Sep 2019 ~ Aug 2020 [11.9 Months]

eLearningPro, Hong Kong

`Javascript` React

`Python` tkinter, pyinstaller

`Art` Adobe Premiere, Adobe Photoshop, Saola Animate (CSS Animation)

Job Detail

- Create HTML5 Games, maintain web pages and construct React frontend application
- Created a python GUI project for text extraction from an image (a work necessary to translate old fresh game into html5 game, detail)

2D Game Artist
Jan 2018 - Dec 2018 [11 Months]

深圳瘋点子科技有限公司, *Sheng Zheng*

- Responsible for constructing 3d accessories, creating environment art and character design. Game that I worked on link

Senior Research Assistant
Mar 2015 - Oct 2015 [6.9 Months]

Department of Mathematics, Hong Kong Baptist University, Hong Kong

- Study HJB equations arised in specific financial games

Research Assistant
Sep 2014 - Feb 2015 [6 Months]

Department of Mathematics, Hong Kong University of Science and Technology, Hong Kong

- Study the property of viscosity solution of HJB equations

Teaching Assistant
Sep 2012 - June 2014 [1.82 Years]

Department of Mathematics, Hong Kong University of Science and Technology, Hong Kong

- Fulfill teaching duty as required in obtaining studentship in the course of M.Phil study. Subjects include:
- Calculus II
- Linear Algebra
- Mathematical Analysis
- Real Analysis