Ching-Cheong Lee

9121-8040 https://github.com/machingclee machingclee@gmail.com

About Me

Graduated from HKUST with an M.Phil degree in Mathematics, worked in both academic and nonacademic fields, with solid knowledge in both frontend and backend programming.

I am passionate about designing software architecture, with rich experience in **(i)** delivering services with appropriate cloud infrasturcture and **(ii)** building devops pipelines to facinitate team's collaboration.

Experience

Software Engineer

Mid of May 2023 ~ Present [1.3 Years]

Wonderbricks Limited, Hong Kong

AWS.	S3, Cloudfront, Lambda, EC2-loadbalancer, ECS-Fargate, Route53, API-Gateway, RDS
Frontend.	Vite, React, Redux-toolkit, React-Native, React-Native-Reanimated, Next, Expo-CLI, Algolia, Socket.io-client, Push Notification for iOS and Android
Backend.	Express (Node.js), Spring Boot (Kotlin), JOOQ, Domain Driven Design, Prisma, Prisma-Kysely, Expo Push Notification, PostgreSQL, MongoDB, Socket.io, RabbitMQ, Redis

Web Application (Mid-05/2023 to Mid-09/2023)

Frontend.

- Revamp and maintain an existing React projects in Typescript

Backend.

- Maintain existing Spring Boot project in Java, build APIs using iBatis and mongo-java-driver

Mobile Application (Mid-09/2023 to Present)

Frontend.

- Developed a realtime text-messaging and LLM based project from scratch by React-Native and EXPO
- Created custom interactive components by React-Native-Reanimated
- Used Redux for state mangement and to control rerendering behaviour of components

Backend and Infrastructure.

Database (PostgreSQL + MongoDB).

- Used Prisma for schema migration for dev and non-dev environments
- Managed user accounts by granting appropriate privileges in PostgreSQL database
- Used both PostgreSQL for business-centric data and MongoDB for complex json object resulted from LLM model
- Designed and adjusted tables in PostgreSQL to fulfll ever-changing requirements

Backend Project 1 (Nodejs Express, serving mobile and web applications).

- Decided to use query builder (Prisma-Kysely) instead of any existing ORMs, making the application readily maintainable by anyone who knows basic SQL
- Designed middleware to let user send text, audio, images via REST apis and broadcast the message via socket.io
- Developed Push notification system for ios and android
- Built repository layer (those return and save aggregates, not DAO) using Prisma-Kysely

Backend Project 2 (Kotlin Spring Boot, payment service).

- Implemented an HandlerInterceptor to authenticate users who log-in using our old backend system
- Integrated with Stripe for purchasing usage limit in our applications, integration includes:
  - Subscribe, upgrade, downgrade and cancel the monthly plans
  - Distribute purchased usage limit to team members
  - Studied all kinds of events and designed metadatas in Stripe operations, enabled the backend to make state change in database according to correct events and metadatas
- Designed test cases via JUnit5 to mimic the subscription processes in various scenarios

Blog

https://machingclee.github.io/blog

Portfolio

https://machingclee.github.io/portfolio

Education

MicroMaster in A.I. and Programming
Tecky Academy
Mar 2019 ~ June 2019

M.Phil. in Mathematics
The Hong Kong University of Science and Technology
Sep 2012 ~ Aug 2014

B.Sc. in Mathematics
Pure Math Option, 1st Class Honor
The Hong Kong University of Science and Technology
Sep 2009 ~ June 2012

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

Kotlin

Spring Boot, JPA, JOOQ, Domain Driven Design, JUnit 5

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

Database Query & Management

PostgreSQL, MongoDB

- Designed APIs to let frontend test Stripe's subscriptions/unsubscription using test-clock
- Built repository layer and complex query via JOOQ
- Made use of Coroutines and context Dispatchers.IO intensively for IO tasks. Had throughout study on R2dbc but decided to keep using Jdbc
- Designed AOPs to track program excution flows and to store domain events because database history is very important to the payment service

Domain Driven Design (DDD, Partially).

- In two backend projects above I studied, introduced and implemented the domain driven design in order to **(i)** handle specfic complex business flow and **(ii)** equip entity objects with behaviours
- In nodejs, we achieved this by eventemitter2 and async-mutex. While in spring boot we used annotations provided by spring boot together with JOOQ without using AbstractAggregateRoot and jpa-repository
- Since we are partially DDD, we didn't implement event sourcing (being monolithic) and aggregates were not restored from event store. We follow the idea from this video to separate data and domain behaviour
- The resulting design is highly extensible, e.g., adding error handling of a specfic step of a chain of API calls, email notification, push notification, etc
- With entity objects being able to have behaviour, the code became more readable, instead of having sporadic services taking (id, ...params) to make database changes.

System Design.

- **Queuing.** Used RabbitMQ to **(i)** Rate limit api which has a limit of 100 concurrent calls (azure openai service); **(ii)** Delay actions by staling messages into DeadLetter Queue
- **Inapp Notification.** Created a table to store notification in granular level, and designed API to enable the frontend to display notification such as **(i)** New messages in a channel; **(ii)** New channels to join; **(iii)** Number of Unread Messages in a chat room
- **Payment.** Allowed users to subscribe, upgrade, downgrade and cancel plans for the extra usage limit in our app

Lambda Functions.

- Developed Lambda functions in python and nodejs to serve various purposes such as file generation and google authentications

iOS Deployment to AppStore with EXPO.

- Handled App Submissions and Rejections via TestFlight
- Created OTA Update to patch the application
- Managed everything above with 3 stages (DEV, UAT, PROD)

DevOps / CICD.

- Created **automated deployment** workflows for frontend and backend via github actions. Automations include:
  - Deployment of containerized node.js and spring boot application using AWS ECS Fargate via the following steps
    - 1. Push to image registry
    - 2. Update task defintion
    - 3. Instruct ECS Serivce to use the updated task
  - Deployment of all frontend projects onto S3 and cache-invalidation in AWS Cloudfront
  - Deployment of Lambda functions
- Implemented email notication system to monitor exceptions triggered by users
- Implemented a script to get log within specific time range from AWS Cloudwatch

Other.

- Initiated a google-authenticated documentation project by using Docusaurus to record detail that our developer should know
- Led, guided and nurtured 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

- Maintained angular project
- Studied eye-tracing related algorithm

Rust

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

Data Streaming/Monitoring

Kafka with Debezium

Message Broker

Rabbit MQ

Art

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

Art Portfolio

https://www.artstation.com/checkercc

- Studied and deployed machine leanring algorihtm in web-app and desktop-app
- Completely translated a BlazeFace model in python into the same model in libtorch of C++ for GUI application
- Implemented methods to ensure weights in pytorch model can be used in libtorch model
- Studied CMake and developed 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

Web Related

- Maintained React Next project
- Implemented data scrapping for house transactions records
- Automated the process of tracking latest rtk-data from official geodetic website and data-processing pipeline using selenium and pywinauto

Object Detection Related

- **Text Detection.** Managed to run an open-sourced text detection (EAST) to facilitate signboard defect classification
- **Crack Detection.** Helped 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

Web Application

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

Machine Learning Related

- Built CSV Importer (together with an express layer and a Flask layer) that can parse a csv/excel file and perform:
  - **Data Classification.** Classified 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), translated all common form of date into YYYY-MM-DD format (sample code)

Frontend 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)

- 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: [1] Calculus II, [2] Linear Algebra, [3] Mathmatical Analysis, [4] Real Analysis.