

# 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

Mid of May 2023 ~ Present <sup>1.25 Years</sup>

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), Prisma, Prisma-Kysely, Expo Push Notification, PostgreSQL, MongoDB, Socket.io, RabbitMQ, Redis

#### Job Detail

##### WEB APPLICATION

###### Frontend.

- Build, revamp and maintain React projects in Typescript

###### Backend.

- Maintain SpringBoot project, build APIs using iBatis and mongo-java-driver

##### MOBILE APPLICATION

###### Frontend.

- Developed this realtime text-messaging and LLM based project from scratch by React-Native and EXPO
- Created custom interactive components by React-Native-Reanimated
- Used Redux to handle complex data-flow and precisely control rerendering behaviour of components

###### Backend.

- **Database (PostgreSQL + MongoDB).**
  - Managed user accounts by granting appropriate privileges in PostgreSQL database
  - Designed tables in PostgreSQL to fulfill ever-changing requirements from product manager
  - Decided to use MongoDB to store feedbacks from ChatGPT which is prompt-engineered by AI/Data Team
  - Made 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
  - Migrated schema of PostgreSQL DB via Prisma, gaining good experience of creating, resolving, and testing migration scripts in dev and non-dev environments
- **Backend Project 1 (Nodejs Express).**
  - Developed this project from scratch serving our 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
  - Implemented JWT authentication and refresh-token mechanism
  - 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
  - Unified the structure of API response so that the frontend can handle errors gracefully
- **Backend Project 2 (Kotlin Spring Boot, Supplementing our Project 1).**
  - Developed this project from scratch focusing on payment services
  - Implemented an HandlerInterceptor to:
    - Authenticate JWT-token of users who log-in using our old backend system
    - Parse token into POJO and save that POJO into ThreadLocal object
  - Integrated with Stripe for purchasing usage limit in our applications, including:
    - Subscribe, Upgrade, downgrade and cancel the monthly plans
    - Distribute purchased usage limit to team members, etc
  - Designed tables to achive the above functionalities
  - Designed metadata's in the operation of stripe objects, enabled the backend to correctly make state change in database according to different stripe events.

## BLOG

<https://machingclee.github.io/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

### Kotlin

Spring Boot, JPA, JOOQ, Axon Framework for CQRS

### 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)

### • System Design.

- Developed **Message Queue System** (wrapped by a class) using RabbitMQ to:
  - Rate limit api which has a limit of 100 concurrent calls (azure openai service)
  - Delay actions by means of DeadLetter Queue
- Developed a **Caching System** to GET and SET cached value in a managable way
- Developed an **Inapp Notification System** by creating a table which separates user-specific data from our API, making those API cachable (userId independent)
- Developed a **Payment System** which:
  - Allow user to pay for multiple subscription plans, upgrade plans, downgrade plans for the extra usage limit on the app that I was developing in Wonderbricks Limited.

### • Lambda Functions (Excel and Word File Generation).

- Developed Lambda function in python that runs a Flask application
- Developed Lambda function in nodejs that runs an Express application

### iOS Deployment to AppStore with EXPO.

- Handle App Submissions and Rejections via TestFlight
- Created OTA Update to patch the application silently
- Managed everything above with 3 stages (DEV, UAT, PROD) with different bundleIdentifier, ascAppId, version and buildNumber, env (EXPO\_PUBLIC\_XXX's)

### DevOps / CICD.

- Created **automated deployment** workflows for frontend and backend via github actions. Automations include:
  - Deployment of containerized application via: [1] push to image registry [2] update task definition and [3] instruct ECS Service to use updated task
  - Deployment of all frontend projects onto S3 and cache-invalidation in cloudfront
  - Deployment of Serverless Express and Flask application for file generation
- Implemented email notification system to monitor backend system behaviour
- Implemented python script to get system log in cloudwatch within a specified time range

### 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 <sup>8.4 Months</sup>

Eye Catching Limited, Hong Kong

Python PyTorch

Typescript Tensorflow, Onnx

C++ Libtorch, Imgui, CMake Ecosystem

### Job Detail

- Maintained angular project
- Studied eye-tracing related algorithm
- Studied and deployed machine learning algorithm 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 <sup>10.9 Months</sup>

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

- Maintained React Next project
- Implemented data scrapping for house transactions records

## 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

## ART PORTFOLIO

<https://www.artstation.com/check-ercc>

- 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 sign-board defect classification
- Crack Detection.** Helped implement detection model for crack and spalling
- Rust Detection.** Implemented two solutions: (i) Text removal, then classification 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 spillings 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 <sup>1.03 Years</sup>

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 <sup>11.9 Months</sup>

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 <sup>11 Months</sup>

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 <sup>6.9 Months</sup>

Department of Mathematics, Hong Kong Baptist University, Hong Kong

- Study HJB equations arised in specific financial games

## Research Assistant

Sep 2014 - Feb 2015 <sup>6 Months</sup>

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 <sup>1.82 Years</sup>

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] Mathematical Analysis, [4] Real Analysis.