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 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 / infra-related websites to facinitate team's development process.

Experience

Software Engineer
Wonderbricks Limited, Hong Kong

Mid of May 2023 ~ Present [1.96 Years]

Skills Applied	
AWS.	S3, Cloudfront, Lambda, EC2-loadbalancer, ECS-Fargate, Route53, API-Gateway, RDS, VPC and VPC Endpoints
Frontend.	Tailwind, Vite, React, Redux-toolkit, React-Native, React-Native-Reanimated, Next, Expo-CLI, Algolia, Socket.io-client, RevenueCat, Push Notification for iOS and Android
Backend.	Express (Node.js), Spring Boot (Kotlin), JOOQ, JPA, Domain Driven Design, Prisma, Prisma-Kysely, Expo Push Notification, PostgreSQL, MongoDB, Socket.io, RabbitMQ, Redis, Stripe and Stripe's Event Integration, Junit5 and MockK
DevOps.	Replicate infrastructure by Terraform, Develop Github Actions to Automate: **(1)** Backend Deployment onto ECS; **(2)** Frontend Deployment onto S3 and Cloudfront; **(3)** Deployment of Lambda functions

1st Year (Mid-05/2023 to 09/2024)

Summary. In the 1st year I focused on building prototypes, completed tasks include:

- Developed a **mobile app** by **react-native**. Functionalities include:
  - Real-time messaging for collaboration
  - Interaction with endpoints from ai-developer to handle business domain logic

  Also deployed to **iOS AppStore** via App-Store-Connect and to **google PlayStore** via Google-Play-Console
- Developed a **webpage** by react as a supplmentary tool for our mobile app
  - Deployed it via S3, Cloudfront and Route53
  - Managed domain-validation for DNS-configuration (forward traffic to 3rd party sub-domain to our cloudfront distribution)
- Built **backends** using **express** (for supporting service such as file-geineration) and **spring boot** (for business logic). What I have done:
  - Designed table with DDD principle in mind (context-first) to solve business problem
  - Designed backend with appropriate layers (application service, domain service, etc) and with domain object in mind (Entity class with rich behaviour)
  - Versioned and migrated database schema via Prisma (an npm package)
  - Invented procedure to reverse-engineer existing tables into @Entity classes and enum variables for spring boot project
  - Invented annotation to auto-generate kotlin-extension function ".toDTO()" to transform an entity class into DTO (no need to write mapper and its class any more)
  - Created SQL-based services for dashboard (statstics purpose only, I strongly oppose writing SQL for business logic, we delegate it to ORMs)
  - CRUD routines

2nd Year (10/2024 to Present)

Summary. In the 2nd year I focused on **DevOps**. I was responsible to the following:

- **CICD**
  - Created github workflows for frontend deployment

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

Infrastructure as Code

Terraform, Serverless Framework

Deployment

Docker, Github Actions

Cloud (AWS)

Security Group, Target Group, Load Balancer, ECS Fargate, Route53, S3, CloudFront, Lambda Functions, API-Gateway, RDS, SQS, VPC

Typescript

Tailwind, React, React-Native, Redux, Redux-Toolkit, React-Query, 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 and MockK

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

- ☐ Created modularized github workflows for auto deployment of **zipped/dockerized lambda functions** and **ECS** services.

  Lambda functions include:
  - – Python flask projects
  - – Spring boot projects

    Remark. We deploy it via **snap-started** lambda functions
  - – Nodejs express projects

    Remark. When zipped file **exceeds 250Mb** we execute this **in docker image**
- • **Cloud.**
  - ☐ Transitted our cloud infrastructure from manual aws console manipulation to generation via **terraform**
  - ☐ **Modularized** our infrastructure as a single terraform module for replicating the whole infra identically to another stage
  - ☐ Developed deployment procedure to switch our working PROD environment into our **well-tested** pre-PROD as quick as possible
  - ☐ Refactored all backend projects to use shared backend variables stored in secret managers
  - ☐ Created terraform project to **manage** and **version** all "console" lambdas and their layers, instead of defining them **sporadically** in aws console
  - ☐ Managed interaction of resources in our **private subnets**. Such as security groups and inline policies for mutual access right

    Resources include:
    - – RDS, RDS-proxy
    - – Lambdas (inside VPC, for RDS-proxy)
    - – VPC-endpoints (e.g., cloudwatch (interface type) and S3 (gateway type))
    - – Loadbalancers (we serve lambdas via ports, i.e., Invokation policies needed)
    - – Websocket-api of apigateway (such as :ManageConnections in order to emit socket message)
    - – NAT Gateway (for services such as google map API to autocomplete addresses)
  - ☐ Architected important services to **lie completely inside private subnets**, only internal services can access it (via internal load-balancer)
  - ☐ **Terraform Output and Display in Webpage**
    - – Created script to upload terraform's output to S3
    - – Created backend for
      - • Simple google-login authentication
      - • Fetch that terraform output and display data such as:
        - ☐ Database URL
        - ☐ All the endpoints and the corresponding lambda function served
        - ☐ ECS metadata to let AI-engineers deploy their docker-image

AI Engineer
Eye Catching Limited, Hong Kong

15 Aug 2022 ~ April 2023 [8.4 Months]

Skills Applied	
Python.	PyTorch
Typescript.	Tensorflow, Onnx
C++.	Libtorch, Imgui, CMake Ecosystem

- • Maintained angular project
- • Studied eye-tracing related algorithm
- • 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
RaSpect Intelligence Inspection Limited, Hong Kong

Sep 2021 ~ July 2022 [10.9 Months]

Skills Applied	
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

Scope: 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

Project 1: Object Detection

- **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

Project 2: Synthetic Data Generation

- **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
EAB Systems (Hong Kong) Limited, Hong Kong

Aug 2020 ~ Mid-Aug 2021 [1.03 Years]

Skills Applied	
Typescript.	React, Redux, React-Native, Express, Mongoose, Sendgrid, Twilio, socket.io
Python.	Pandas, Tensorflow v2

Project 1. 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

Project 2. 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

Skills Applied

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 properties 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.