HONGYU, TENG

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I am an experienced developer with an ambition to bring a better visual experience to everyone through Computer Graphics. Prior experiences stem in the industry and research, including an internship at Google, a co-founder and CTO experience of a social network start-up, and a published paper in IEEE. I am skilled in Computer Graphics, Software Engineering, Algorithms, Machine Learning, Data Analysis, and Full-stack Development. I have used several tech stacks, frameworks and many programming languages.

Education

Imperial College London — 2019 – 2023

Mathematics and Computer Science (MEng)

- Courses🔗: covering numerical methods, computer graphics, computer vision, machine learning, reinforcement learning, data analysis, concurrency, distributed system, program analysis, compilers, operating system, and software engineering practices.
- Individual Project: Differentiable Rendering using JAX for Differentiable Physical Simulatior Brax and Next Generation Reinforcement Learning Framework CORAL.

National Junior College, Singapore — 2015 – 2018

Work Experiences

Consumer Health Research and Technology, Google

Software Engineering Intern — *London, United Kingdom,* May 2022 – Sep 2022

- Under the guidance of host, learning native Android development using Kotlin, building a fully working Wear OS app on my own, with collaboration with UI/UX colleague and domain expert.
- Involving in-device sensor data collection, scheduled and on-demand computation, persistent data storage, a background service (with ongoing notification + activity) for consistent data collection. A digital watch face is also implemented, that would respond to changes of collected and computed data. This is deployed in both Wear OS 2.x and Wear OS 3.
- Deployed internally with evaluation of the app's effectiveness of achieving goals.

Octaface — From Acquaintances to Friends🔗

Co-founder, Tech Team Lead, Full-Stack Developer — *Nanjing, China,* Jul 2020 – Dec 2021

- Oversee the scheduling and whole lifecycle of features, coordiante with UI designers.
- Lead tech team to cooperate with design team to implement an iOS/Android app (Flutter), necessary backend (Flask + MongoDB), and integrate 3rd-party services (Image, Push, SMS).
- Developed instant messaging service from scratch, supports direct and group messaging with advanced privilege management; help refactor information flow section and contacts system.
- Having 50+ beta users for a year, handling hundreds of messages in 20+ groups per day.

Cloud Gaming Solution based on Project *Gaminganywhere*🔗

Part-time Developer — *Nanjing, China,* Mar 2019 – Sep 2019

- Develop a platform for cloud gaming (especially on mobiles) with project *gaminganywhere*.
- In charge of the streaming (C++), P2P connection module (Golang).

Project Experiences

JaxRenderer: Differentiable Soft Renderer

Final Year Individual Project *London, United Kingdom,* Dec 2022 – Jun 2023

- Differentiable renderer based on rasterisation, with a full rendering pipeline similar to OpenGL.
- Support customised shaders. Included Gouraud and Phong shaders with texture and shadow.
- Using JAX, the whole renderer executes efficiently and seamlessly across CPU, GPU and TPU. The code supports all JAX built-in functions including jit and vmap for batch execution.
- Substitute the existing CPU renderer used in differentiable physics simulator BRAX, with a compatible layer mimicking the exact same behaviour for easy substitution.
- Future extension includes making the renderer fully differentiable, and build a ray tracer in JAX

Image Processing Engine with GUI (IPEwG)

Third Year Group Project *London, United Kingdom,* Oct 2021 – Jan 2022

- Open-source cross-platform image processing engine with common techniques done right and advanced features available, with an intuitive grapical interface, implemented in Kotlin.

Deeplang: A Programming Language for IoT Device

Low-Level Developer *China,* Sep 2020 – Jan 2021

- Develop the memory management module for the backend virtual machine in C.

Algorithm Selection for Classification Problems via Cluster-based Meta-features

First Author *Singapore,* Jun 2016 – Nov 2018

- A step towards automatic machine learning (AutoML) by proposing new meta-features.
- Published and presented in 2018 IEEE International Conference on Big Data (Big Data).

Other Experiences

Undergrad Teaching Assistant / Imperial College London Oct 2020 – Jun 2021

- Teaching Assistant for first year students' regular lab sessions (Haskell, Java, Kotlin, C).

Academic Lead (Computer Vision Course) / TechX 2019 Jul 2019

- Teaching Assistant in Computer Vision Course; Technical support in Hackathon.

Grade A / Peking University Summer School Jul 2019

- Quantum Computation and Quantum Communication Course (2 weeks)

2nd Prize (School Category) / Code::XtremeApps::2017 (Hackathon) Jul 2017
Silver Award / National Olympiad in Informatics, Singapore Mar 2017, 2018

Skills Summary

- Video enhancement, processing and encoding skills using VapourSynth + x265 pipeline.
- Passion and experience in rendering, photography and optimisating existing solutions; strong interest in working in high performance computing infrastructure and pipeline.
- Rich experience in leading teams, cross-disciplinary cooperations and project management.
- Most comfident in: Python and modern C++.
- Used intensively in prior work and project experiences (in alphabetical order): C, C++, Flask, Flutter (Dart), Git, JAX, Kotlin, MongoDB, Python, SocketIO, SQLite.
- Used in small projects or courseworks only: C# (Unity), Elixir, Golang, Haskell, Java, JavaScript (TypeScript), Lean, Next.js, React, TailwindCSS, TornadoFX, Win32 API.

References Available on Request