

# KUANG-YU LI

Full Stack Developer, Cloud Specialist, DevOps Advocate

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## EXPERIENCE

**Google** – Taipei, Taiwan Mar. 2022, - present (9 month)  
*Software Engineer, Device and Services, Developing Modem System Software on Pixel phones and wearables*

- Developed Google Embedded Modem System (GeMS) as an RTOS framework to provide high quality and reusability modem system code for Pixel phones and wearables based on Pigweed, a open source embedded-targeted libraries. (C++17, GN Build, Clang compiler)
- Designed and Implemented 2 GeMS OS primitives: Memory and Queue for Exynos Modem 3500 and Snapdragon SW5100 platform and implemented 3 Pigweed OS primitive backends : System Timer, Thread Notification and Assertion Log on ShannonOS.
- Facilitated GeMS infra to follow Google SW core practices by 1) configuring static analysis(clang-tidy), formatting(clang-format), and license check(addlicenses) in presubmit checks to improve code quality and readability and 2) developing a Plugweed plugin for automatic API reference Doc generation (Doxygen)

**IBM** – Böblingen, Germany Apr. 2021 - Sept. 2021  
*Intern, IBM Systems: Modernized mainframe development environment*

- Developed a TypeScript cloud-native remote IDE for Ubuntu on IBM Z15 based on Eclipse Theia and VSCode Extension API using Scrum
- Verified IDE feasibility and compatibility by deploying and testing Eclipse Theia on Hyper Protect Server and Eclipse Che on Minikube
- Integrated, tested, and deployed C++ dev tools to Codeready Workspace w/ CMake, IntelliSense, CTest, GDB and GoogleTest functionality on a self-administered OpenShift Container Platform on zFyre
- Automated Theia deployment with bash script for installing packages and packaged application into Docker image file with Dockerfile
- Improved z/CECSIM server development productivity by rewriting traces (15 files and 400 lines) from C filestream API to POSIX system call, to ensure trace visibility when crashing.

**MediaTek, Inc.** – Hsinchu, Taiwan Dec. 2015 - Aug. 2019  
*Firmware Engineer, Communication System Design: Developed embedded firmware for 4G and 5G*

- Developed embedded firmware in MediaTek's Android platform for 4G LTE and 5G NR physical layer (PHY) digital signal processing
- Contributed to 6k and maintained 20k lines of code in C/C++ for 3 large-scale projects (over 200k lines and 1,000 developers) including 2019 world's fastest 5G modem Helio M70 with downlink throughput of 4.7 Gbps
- Designed mobile modem receiver modules, implemented OFDM signal processing algorithms accordant with 3GPP Spec, integrated build and auto testing process for design and system verification with Perl and Python scripts
- Resolved urgent system function and performance issues for over 10 MediaTek's Helio X and P series smartphone products with log examination, signal and procedure analysis, solution formulation and implementation, patch verification and release
- Received 7 MediaTek vAwards (top 10% monthly team performance) including improving 4G downlink data rate by 300% (14→42 Mbps) with Massive MIMO feature and reducing 5G control channel decoding computation cycles by 72% (3700→1000 cycles)

## TECHNICAL STRENGTHS

**Language** Java (expert), C++ (fluent), Python, JavaScript, Shell Script (familiar) **DevOps** Git, Docker, Kubernetes, Travis CI  
**Database** SQL: MySQL | NoSQL: PostgreSQL **Web** Spring Boot, MVC, JPA/Hibernate, Data REST, Angular, NGINX  
**Cloud** AWS: EC2, Elastic Beanstalk, SQS, RDS, S3, ElastiCache | Google Cloud: Kubernetes Engine, Functions, Pub/Sub

## EDUCATION

**Universität Stuttgart** – Stuttgart, Germany Oct. 2019 - May. 2022  
*M.S. in Information Technology, GPA: 3.53/4.0, German Grading: 1.7 (Gut)*

**National Chiao Tung University (NCTU)** – Hsinchu, Taiwan Sept. 2009 - Oct. 2015  
*B.S. in Electrical Engineering and Computer Science, GPA: 3.9/4.3 | M.S. in Electronics Engineering and Electronics, GPA: 4.27/4.3*

## PROJECTS

**Content-Based Router for Publish-Subscribe Service** Java, REST API, HTTP Distributed System Lab  

- Developed a publishing service and routing controller in a Java module. The service receives subscription via HTTP (GET, POST, and DELETE) and controller provides content-based routing for the service to minimize network traffic and reduce application filtering effort.
- Developed a "Subscriber" Java application which can subscribe to publishing service via REST API and receive UDP from publisher.

**Dynamic Routing for Software-Defined Network** Java, TCP, Dijkstra's algorithm Distributed System Lab  

- Developed a Java module in Floodlight controller with 2 routing modes in OpenFlow network based on Dijkstra's algorithm.
- Reactive routes with shortest path. Adaptive routes TCP flow with load balancing by dynamic traffic query on IP and TCP port pair.
- Verified application with Iperf in MiniNet on Linux and achieves 6x bandwidth increase (582kbs vs 3478kbs) in adaptive mode

**Java Application for Wireless Ad-hoc Network** Java, UDP, Raspberry Pi Mobile Computing

- Developed 4 Java server and client applications for Flooding and Dynamic Source Routing (DSR) protocols. Flooding achieves high robustness with UDP messages broadcast. DSR achieves reduced data transfer overhead with route discovery in control messages.
- Verified on Raspberry Pi in IPV6's mesh 802.11 WiFi network; Applications use java.net.DatagramSocket for UDP transmission.

#### **Android App for City Temperature with Google Firebase** Java, Android

Mobile Computing

- Developed an Android application, which can update, subscribe, and calculate daily average of designated city temperature
- Implemented functions for accessing and querying data in JSON in a shared Realtime NoSQL database with Google Firebase API

#### **ATP Tennis Player Network Analysis** Python, Graph, NetworkX

Complex Network System

- Developed Python programs to generate complex network and derive structural insights such as Page Rank, Connectivity, Clustering, etc.
- Implemented algorithms with NetworkX package and built an undirected graph by processing real tennis match statics in csv format.
- Discovered, visualized, rendered and exported network topology with open-source software Gephi