Ziliang (Johnson) Zhang

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Education

University of California, Riverside (UCR)
Doctor of Philosophy, Electrical and Computer Engineering (GPA: 4.00)   Sep 2022 - (Exp.) Jun 2027
Master of Science, Computer Engineering   Sep 2019 - Mar 2021
Area of Expertise: Embedded Engineering, Real-time System, Architecture, On-Device Machine Learning

University of California, San Diego (UCSD)
Bachelor of Science, Cognitive Science Specialization in Human-Computer Interaction   Aug 2015 - Mar 2019
Area of Expertise: Artificial Intelligence, Algorithms, Data Science, Software Development, UI/UX

Embedded System Experience

PhD Researcher @ Real-Time Embedded and Networked System Laboratory, UCR   Sep 2022 - Present
- Researched and Deployed DNN Model on Battery-less edge devices using FRAM/MRAM on an **ARM Cortex-M4** FPU-based SoC, submitting to CPS week in 30th IEEE Real-Time and Embedded Technology and Applications Symposium (**RTAS**), Top Tier Embedded system conference with 24% acceptance rate.
- Adopted above research on Soil Sensors that include Energy Harvester, GPIO, ADC interrupts, sensor polling and transmission in UART&SPI w/ FreeRTOS. Achieved execution correctness at intermittent power
- Deployed the Soil Sensors to UCR Greenhouse with 100+ Devices and 1 Raspberry Pi as hub to post to InfluxDB. Maintained with Grafana and achieved a 99%+ QoS with low latency/packet loss during 6 months

Team Leader @ Real-Time Embedded System Project, UCR   Jan 2023 - June 2023
- Committed to **Linux-5.15** kernel code by changing IOCTL, LKM, High-resolution Timer, RTC and TCB to enable real-time support on Linux. Maintained high QoS and Timeliness Correctness of 1k+ concurrent tasks on an Oracle Cloud Server and a local PC with VMware and VirtualBox hypervisor.
- Flashed the kernel to Raspberry Pi 4B and added embedded system support of the real-time scheduler. Made the kernel scalable from server to embedded level with high versatility, portability and extensibility.
- Lead the project by conducting weekly scrums. Used Git, Travis and Docker for CI/CD and achieved a 0% deadline miss in the half-year development cycle. Pivot to 100+ audience and received 95%+ recognition

Embedded Software Development Experience

Full-Stack Software Engineer @ Verizon   Jul 2021 - Sep 2022
- Developed and Maintained highly scalable micro-service API in 5GBI team that had 70M+ monthly traffic without outage. Experienced 5G Gateways Enterprise-level Router&Server Development
- Used Jenkins, Postman and JIRA for Testing. Used Git, Docker as **CI/CD** process for TDD and concurrently developed in 4 testing environments and 2 deployment environments to ensure robustness
- Followed SDLC in **Agile/Scrum** and Waterfall methodologies. Familiar with Pair Programming. Maintained monthly sprint and collaborated with 7 groups inside Verizon Global Network

Graduate Researcher @ Extreme Storage & Computer Architecture Laboratory, UCR   Sep 2020 - Mar 2021
- Conducted 1080P 30FPS Pose Estimation and pipelined through teleconferencing software within 1GB **RAM Constraints** on a coral SoC. Project link: https://izenderi.github.io/pdfs/Final_OpenRPT.pdf
- Designed and Deployed TFLite model and engineered it on top of Google Posenet. Reduced the inference latency by **83%** through edge TPU accelerator and embedded C programming
- Optimized System Communication Latency by **50%** from USB, TCP/IP, UDP and V4L2 in kernel. Used **Bluetooth PAN** to Achieve One-step Setup and Operation to target senior clients or users with disability

Technical Skills

Programming Language: C/C++, Java 8/11, Python 2/3, Shell, Embedded C, CUDA C, SQL, AvX, MATLAB;
OS: Linux/UNIX, Embedded Linux, FreeRTOS, QEMU, Xv6, Real-Time Scheduler, Real-Time System, LKM
Protocols: I2C, USB, UART, SPI, TCP/IP, UDP, Bluetooth, IOCTL, V4L2, DMA, SWO, CAN bus;
Embedded System: DSP, SoC, MCU, RISC-V, ARM, IoT, GPU, TPU, MRAM/FRAM, GPIO, PWM, ADC, RTC;
Data Analytics: Anaconda, Pandas, Matplotlib, Scikit-learn, Seaborn, R, BeautifulSoup
ML/DL: Tensorflow, PyTorch, OpenCV, CNN/DNN, LSTM, Transformer, Reinforcement Learning, Distillation;
Dev Tools: GIT, Docker, VMware, JIRA, Jenkins, KEIL uVision, Eclipse   **Testing**: JLink, Tracing, GDB, TI CCS;
Dev Teamwork: Agile/Scrum Methodology, Test-Driven Development, CI/CD Tools (GIT, Docker, Kubernetes);