Yeqing Yang

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EDUCATION

Beijing Jiaotong University ***Beijing, China***

Master of Science in Computer Science *Aug. 2023 – Present*

- Developed AI-SPINE, a collaborative platform that integrates several segmentation models for DICOM and CT scans. Utilizing advanced distributed web services based on Django, MySQL, and Redis, aids doctors in determining the placement of fusion devices during real orthopedic operations.
- Designed and built medical segmentation models based on the Segment Anything Model (SAM), specifically tailored for orthopedic segmentation. This visual solution incorporates Vision Transformer (ViT) and multimodal prompt mechanism.
- Courses: Advanced Operating System: 92, Heterogeneous Computing

Beijing University of Technology. ***Beijing, China***

Bachelor of Engineering in Software Engineering Experimental Class (**GPA: 90.81/100**) *Sep. 2019 - Jul. 2023*

- Honours: Beijing Outstanding Graduate Project, 2023 | BJUT Academic Outstanding Student in 2020,2021,2022
- Courses: Principles of Compiling: 99, Computer Networks: 91, Principles of Database System: 94, Data Structures and Algorithm: 85, Cloud-based Service Engineering: 95, Java Programming 95, Python Programming 92
- Prizes: 3rd Prize in IEEE Xtreme International Competition,2020
  2nd Prize in Mini Program Application Development Competition, China Collegiate Computer Contest, 2021.
  3rd Prize in "Internet+" College Students' Innovation and Entrepreneurship Competition.

WORK EXPERIENCES

Anxinsec Technology Co., Ltd ***Beijing, China***

Linux Backend Developer Intern, R&D Department *Oct. 2022 – Feb. 2023*

- Possessed extensive experience in Linux System development at the kernel level, acquiring proficiency in process management (including fork, exec, and inter-process communication), pipeline utilization, hook implementation, file system modules such as inotify, and memory allocation mechanisms.
- Acquired C++ development skills in a Linux environment, which involved using tools such as gcc, cmake, and packages like Boost.
- In order to trace memory leak, modified and compiled Linux kernel version 5.8.1, facilitated the addition of new syscalls.
- Gained knowledge of project management processes, leveraging self-hosted Git platforms like GitLab Enterprise, along with tools such as Jira for project and bug tracking, and Jenkins for testing and CI/CD pipeline management.
- **Project 1: Developed a novel module named 'Asset Engine' within the Linux backend agent, designed to scan and identify installed web services and packages on the host server through process detection.**
  - ❖ Responsible for the creation of local scan and storage structures for automated scanning of installed web services and npm packages using process and thread detection. Include PID and TID tracing for extensive running information. Scan results were serialized into local SQLite database and transmitted to backend server via Protocol Buffers.
- **Project 2: Enhanced scan performance and streamlined workflows, specifically tailored for high-load Linux servers.**
  - ❖ Collaborated with colleagues to implement a performance enhancement during scan process. This system automatically selects between using regular read-load FIFO on external storage or constructing memory-based index. Added rapid cache construction and monitoring complemented by inotify. Increased the scan module's performance by an average of 15%.

Chinasoft International Technology Services Co., Ltd. ***Remote***

Software Engineer Intern, Distributed Developed Department *Jul. 2022 - Aug. 2022*

- Implemented an aggregation policy in distributed system construction, specifically within Hadoop and Spark clusters, utilizing Java, HDFS, Yarn, and MapReduce. Learned both SQL and HQL in the real production environment and basic database optimization.
- Developed custom HQL search queries and integrated MapReduce results into a data visualization API system. Conducted an in-depth analysis of HBase and MySQL source code to compare design differences between single and distributed database systems.

PixelPunk, Inc ***Beijing, China***

Product Management Intern, Product RD Department *Jun. 2021 - Sep. 2021*

- Involved in entire product building process, including planning, designing, developing, testing, publishing, and iterating.
- Studied backend architecture building, basic image transforming, and processing methods using Python and deeper implementation in C++. Enhance the overall software production process by focusing on project management, research, evaluation.

ACADEMIC AND PROJECT EXPERIENCES

Miniob Database System ***Beijing, China***

An open-source database system designed for easy deployment and beginner-friendly learning *Sep. 2023 – Present*

- Added support for new database fields, such as DATES, starting from lexical analysis using Bison and YACC, to database-level storage engine includes a multi-threaded B+ tree implementation, then integrated into the Linux system's storage mechanism using fixed-length pages. Familiarized with developing and running in Docker environments.
- Learned database index sub-system design, inter-process communication, and data transfer between the kernel and the client. Also added new features such as UNIX socket connection and a basic concurrency handle entrance function.

National Key Research and Development Program of China ***Beijing, China***

AI-assisted Matching Technology of Fusion Apparatus Preoperative Planning for OLIF *Aug. 2023 – Present*

- Serve as the main backend developer and system architect, responsible for designing the web infrastructure architecture. This includes using Django as the backend framework, designing the database structures and tables, embedding the medical AI segmentation model, and constructing the data transfer pipeline using Socket and TCP. Responsible for system refactoring now.
- Designed an embedding protocol that combines model weight, network, and data flow. The objective of this protocol is to serve as an assistant for automatic spine detection, vertebrae segmentation, and the generation of optimized positions for fusion devices between inter-vertebral spaces.

YOLOv5_HNet ***Beijing, China***

A Hardhat Detection Model based on YOLOv5 *Mar. 2023 – Jul. 2023*

- Augmented YOLOv5 convolutional kernel by integrating a new 'Focus-Conv' layer preceding the C3 convolutional layer. This enhancement broadened the vision fields of the convolutional operation, substantially improving detection precision on small objects such as remote hardhats, leading to an approximate 5% increase in mAP@50 in both car factory and power plant scenarios.
- Streamlined the YOLOv5 network structure by integrating a ShuffleNetV2-like multi-stage structure as the new backbone, reducing the parameter scale and resulting in a 20% increase in FPS across various scenarios.

Frodo ***Beijing and Shanghai, China***

An Easy-to-Use Federated Learning Framework *Mar. 2023 – Jul. 2023*

- Engineered a lightweight Federated Learning framework using Python, focusing on new aggregation method termed 'Asymmetrically Federated Learning' by analyzing round results on host then broadcasting diverse learning parameters also include federated transfer learning. Resulted increasing in mAP@50 by approximately 4.5%.

Cloud-based Service Engineering Course Design ***Beijing, China***

Educational Cloud System *Sep. 2021 – Dec. 2021*

- Developed a visualization system that allowing teachers to capture and analyze data about students' progress and outcomes in order to assist in teaching. Successfully implemented the system for the Honors College of BJUT that uses Django, MySQL and Redis. Using uWSGI for deployment in a real production environment.

COMPETITON EXPERIENCES

China Collegiate Computer Contest ***Beijing, China***

*Note Taking and Thought Recording Mini-Program (**The Second Prize**)* *Apr. 2021 - Oct. 2021*

- Designed a Progressive Web App for note-taking and idea capturing. Backend using Java and MySQL, with Nginx used as a reverse proxy and load balancer.
- Developed API support for rapid attachment and idea posting, facilitating the use of diverse data plugin solutions in accordance with our Restful API rules. Successfully debugged via Postman, established connections with WeChat chat accounts and Telegram Bots, and able to integrated numerous online SaaS platforms.

National College Students' Innovation and Entrepreneurship Training Programme ***Beijing, China***

AR Spatial Computing Measure App for iOS and Android *Oct. 2020- Sep. 2021*

- Inspired by Apple's ARKit, developed a universal AR measure app for both iOS and Android, which could choose between the dual-camera or LiDAR scanner to function as typical ruler or employ new method of measurement using shape filling.
- Utilized FPGA to run the same algorithm with hardware acceleration using heterogeneous computing optimisation methods.

SKILLS & HOBBIES

- Programming Languages: Python, C/C++, Java, JavaScript, HTML/CSS,, Bash, SQL
- Tools and Frameworks: Git, LATEX, DJango, SpringBoot, Docker
- Language Skills: Native in Mandarin, Proficient in English(C1) (**IELTS 7.5-L:8.0, R:9.0, W:6.5, S:7.0**| **GRE 325-V155, Q170, AW3.0**)
- Hobbies: Photography, Video shooting and editing, Tennis, Badminton, LEGO Building, Blogging.