Boxian DENG

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OBJECTIVE: To obtain a challenging position where I can devote myself to backend software development, with focus on distributed systems, cloud computing, big data, etc., and I am always improving myself by learning new skills.

EDUCATION

Carnegie Mellon University (CMU) *Pittsburgh, PA*
Master of Science in Mechanical Engineering - Research; GPA:3.92/4.0 *May 2020*
Courses: Cloud Computing, Distributed System, Principles of Software Construction, Introduction to Computer System
Introduction to Machine Learning, Deep Learning for Engineers, J2EE Web Application Development

Shanghai Jiao Tong University (SJTU) *Shanghai, China*
Bachelor of Engineering in Naval Architecture and Ocean Engineering; GPA: 87.0/100.0 *Jul. 2018*
Minor in Computer Technology and Application; GPA: 87.2/100.0
Courses: Programming Methodology (C++), Data Structures, Operating System, Computer Organization and Architecture

LANGUAGES AND SKILLS

- **Programming Languages:** Java, Go, C/C++, Python, SQL, PHP, JavaScript
- **Cloud Infrastructure or Platform:** AWS, Microsoft Azure, Google Cloud Platform
- **Skills and Tools:** Git, Linux, MySQL, HBase, MongoDB, Sprint Boot, ReactJS, Docker, Kubernetes, Hadoop, Apache Spark, Maven, PyTorch, Django, Node.js, HTML, CSS, MATLAB/Simulink

WORK EXPERIENCE

The School of Computer Science, Carnegie Mellon University *Pittsburgh, PA*
Teaching Assistant in 15-319/15-619 Cloud Computing Course *Jan. 2020-May 2020*

- Developed a project about developing and deploying cloud-native microservice application with **Dockers and Kubernetes.**
- Designed a new task on routing external traffic to web applications across multiple clouds by path with **Azure Front Door**.
- Developed and deployed CI/CD pipeline on **Azure DevOps** for automatic grader deployment.

SafeAI Lab, Carnegie Mellon University *Pittsburgh, PA*
Research Assistant *Jan. 2019-May 2020*

- Developed a website for scenario-based self-driving dataset with **Spring Boot**. (Website link: http://traffic-net.org)
- Designed schema for scenario-based information in **MySQL**. Stored heterogeneous unstructured data in AWS S3.
- Containerized the web service with **Docker** and deployed the website on AWS EC2.

Siemens Corporate Technology *Princeton, NJ*
Robotics Software Intern *May. 2019-Aug. 2019*

- Processed Intel RealSense camera video to recognize different types of gears by Convolutional Neural Network. Proposed and implemented a localization algorithm for gears with AR-markers and **OpenCV**.
- Designed and integrated the database with **MySQL** for inventory management, which updates events, inventory, current state simultaneously with recognition. Successfully demonstrated the system in front of the department and customers.

SELECTED PROJECTS

Tribbler, A Distributed Information Dissemination Service *CMU, Oct 2019-Dec 2019*

- Constructed an RPC-based **distributed key-value store** system with **Golang**.
- Designed a thread-safe service in backend storage servers using partitioning and **consistent hashing** to improve scalability.
- Designed and implemented a **caching** protocol to improve throughput, keeping cache consistent with lease mechanism.

High Performance Twitter Big Data Analytics with MySQL and HBase *CMU, Feb. 2019-May.2019*

- Extracted, transformed and loaded (**ETL**) Twitter dataset (>1TB) into **MySQL** and **HBase** with **MapReduce**.
- Deployed a Twitter analysis web service on AWS EC2 with **Terraform**. Achieved 20,000+ RPS in user recommendation web service and 8000+ RPS in top words web service (class top 3).
- Containerized the web service and deployed on **AWS ECS** (Elastic Container Service). Migrated database to **AWS RDS**.

Distributed Bitcoin Miner with a Reliable Live Sequence Protocol *CMU, Sep. 2019-Oct.2019*

- Implemented a robust and reliable TCP-like network protocol on top of UDP with **Golang**, which guarantees in-order delivery and integrity. Adopted a sliding window algorithm to avoid traffic congestion.
- Handled dropped messages and monitored the connection status with an exponential back-off approach.
- Designed and developed a distributed min-hash bitcoin miner to achieve load balancing and failure detection and recovery.

Stream Processing with Kafka and Samza on Driver-Client Matching *CMU, May.2019*

- Implemented a real-time Uber-like recommendation application by aggregating streaming data using **Kafka** and **Samza**.
- Partitioned the stream by blocks and analyzed the stream using **Samza** on **AWS EMR** cluster.