Leihao Chen

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EDUCATION

Carnegie Mellon University **08/2022-12/2023**
Master of Science in Machine Learning, School of Computer Science

University of Illinois at Urbana-Champaign **08/2017-05/2021**
Bachelor of Science in Electrical & Computer Engineering, minor in Computer Science GPA 3.98/4.0
Honors: Edward C. Jordan Award, Illinois Engineering Achievement Award, COVID Wall of Recognition in Engineering

SKILLS

Programming Languages: Python, Java, C++, Golang, Objective-C, Swift, JavaScript, HTML, CSS, MATLAB, Shell
Frameworks and Tools: K8s, Apache Hadoop, Spark, Kafka, Hive, SQL, NoSQL, AWS, TensorFlow, Node.js, Django

PROFESSIONAL HISTORY

TikTok Inc., ByteDance Ltd. **04/2022-08/2022**
Software Engineering Intern Remote & Mountain View, California

- Creating an image-based ad blocker for the TikTok web browser to detect and block malicious advertisements with MobileNetV3. Streamlined the backend data pipeline for data processing, model performance visualization, model retraining, and model serving in **Apache Spark** and **Hadoop**.
- Deployed the data pipeline to process application logs from user devices and handle model input images (~10GB daily).
- Designing a REST API server for image deduplication, inspired by source code of the latest image-based phishing classification algorithm in Chromium Safe Browsing. Managed to deploy this service into production utilizing microservice components including **S3**, relational storage, and **Redis** cache.

Red Hat, Inc. **07/2021-04/2022**
Software Engineering Intern Remote & Boston, Massachusetts

- Solely responsible for designing and developing Curator, an open-source application providing real-time infrastructure consumption analysis for the OpenShift Kubernetes Platform, which is integrated into two consumer cloud clusters.
- Implemented a **Kubernetes** operator that collects **Prometheus** metrics data stream into **Presto Database**, which supports REST API and **Apache Superset** (a data exploration and visualization system) for users to run analytical queries.
- Closely collaborated with cloud provider's cost management team to constantly deliver valuable features using **Jenkins** for task automation and CI/CD workflow.
- Created push notification service to periodically send out utilization summary to cluster users via email and slack.

Health Care Engineering Systems Center at University of Illinois [GitHub] [Publication] **04/2020-08/2020**
Software Engineering Intern Champaign, Illinois

- Built the university official mobile app for COVID-19 (DAU: 20K+) that warns students of possible contact with infected individuals through anonymous proximity tracing.
- Developed data collection and analysis service to generate status cards displaying COVID-19 risk in **Gin** web framework.
- Analyzed and implemented Google's anonymous contact detection algorithm with Bluetooth Beacon on **iOS** and **Android**.
- Research result was selected by *The Network and Distributed System Security Symposium 2021: Innovative Secure IT Technologies against COVID-19 Workshop.*

RESEARCH EXPERIENCE

IBM-Illinois Center for Cognitive Computing Systems Research [Thesis] **05/2020-05/2021**
Mentor: Sanjay Patel, Jinjun Xiong *MLModelScope: A Distributed Platform for Machine Learning Inference*

- Ensured the scalability of the computation backend by incorporating master-worker architecture using **Kubernetes** where the master node serves as a resource-based load balancer to dispatch the workload among workers.
- Managed to introduce a Kubernetes' experimental feature to enable GPU scheduling. Improved the users' flexibility on requesting GPU memory quota and selecting certain models of GPU using **Apache Kafka**.
- Cooperate with IBM research team to run this machine learning inference service on heterogeneous server architectures.

Labeling Cost Sensitive Batch Active Learning for Brain Tumor Segmentation [Publication] &
Distributed Training in Machine Learning **02/2020-12/2020**
Mentor: Sanmi Koyejo Trustworthy Machine Learning Group

- Designed distributed training platform with **gRPC** and **Docker** to overcome data sharing issues in multi-party training.
- Invented a novel core-set selection approach to reduce size of labeled training dataset required in Computer Vision.
- Designed efficient algorithms to solve combinatorial optimization in Batch Active Learning.
- Co-authored a paper on *The IEEE International Symposium on Biomedical Imaging 2021*.