Shengjie Ma

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Education

University of Illinois Urbana-Champaign | *Urbana and Champaign, Illinois* **Anticipated 05/2025**

- Master of Computer Science

Peking University | *Beijing, China* **09/2019 – 07/2023**

- Bachelor of Science in Computer Science and Technology
- GPA: 3.78/4.0 (Top 10%)

Work Experience

DiDi **03/2023 - Present**

Backend Research & Development Intern - Inter-City Ride-Sharing Team

- **Performance Optimization:** Reduced service initialization time by 95% by introducing the object pool design pattern
- **Data Analytics:** Built an inter-city travel route discovery tool using hexagonal spatial indexing and hot area discovery
- **Quality Assurance:** Implemented a test case generator that fires virtual ride-sharing requests at 100+ rps
- **Team Work:** Partered with a five-member group in feature development of the inter-city ride-sharing service

Wangxuan Institute of Computer Technology **08/2021 - 11/2022**

Research Intern - Multimedia Information Processing Lab, Supervised by Prof. Yang Liu

- **Transfer Learning:** Proposed a mutual information knowledge transfer mechanism to tackle the Novel Category Discovery task, transferring knowledge from known categories to cluster samples from unknown categories
- **Multi-Modal Learning:** Incorporated a cross-modal memory bank to the model associating visual instances with their semantic labels, improving clustering accuracy by 1.4% on ImageNet and 2.8% on CIFAR100

Skills

- **Programming Languages:** C/C++, Python, Java, SQL, HTML, CSS, JavaScript
- **Machine Learning & Data Science:** PyTorch, NumPy, Pandas, Scikit-Learn, Matplotlib, NetworkX
- **Tools:** Git, Shell, Docker, Kubernetes, Knative, CMake, LaTeX, Vim, Perf
- **Soft Skills:** Design Patterns, Software Reliability, Project Management, Cross-Functional Team, Leadership

Projects

Multi-Resource Serverless Function Scheduler | *C++, Python, Apache Thrift, Kubernetes, Knative*

- Implemented SerPipe, a serverless function scheduler on Knative serverless computing platform
- Designed a scheduling policy that boosts resource utilization by pipelining function invocations and co-locating functions of different bottleneck resources, decreasing end-to-end latency by 28% at most
- Modeled the function co-location problem as a maximum weight matching on a complete weighted graph

Inter-City Travel Routes Discovery Tool | *Python, Pandas, H3, Kepler.gl*

- Optimized inter-city travel routes to be more driver-friendly by restricting start and end positions within hot areas
- Proposed optimization plans for tens of route groups using the tool, increasing answer rate in Kunming city by ~20%
- Provided interactive hot area visualization based on Uber's open-source project kepler.gl

Youming Bulletin Board System | *Python, HTML/CSS/JavaScript, MySQL, Flask, Jinja*

- Published a bulletin board website where visitors can chat by posting comments and opening threads
- Enabled 5+ advanced features to ensure the community's safety and to promote ease-of-use including user authentication, filling in user information, stars, likes and dislikes of comments, post searching, etc.

PintOS: a Simple Operating System with 80x86 Architecture | *C*

- Implemented various features for PintOS: (1) priority scheduling and MLFQ scheduling; (2) argument passing, user memory access, and system calls; (3) virtual memory features like demand paging, stack growth, and mmap.