Hui Xu

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EDUCATION

Masters in Engineering Artificial Intelligence - GPA: 3.67/4 **Aug 2024 - Dec 2026**
State University of New York - Stony Brook *NY, USA*
Coursework: **Distributed System**, **Natural Language Processing**, Deep Learning Algorithms and Software
MAQuA: Adaptive Question-Asking for Multidimensional Mental Health Screening using Item Response Theory
Accepted to EACL 2026 (Main Conference) *(view paper)*

Masters in Computer Application Technology - GPA: 4/4 **Sep 2013 - June 2018**
Beijing Forestry University *Beijing, China*

Bachelor in Information Management and Information Systems - GPA: 3.9/4 **Sep 2009 - June 2013**
Beijing Forestry University *Beijing, China*

WORK EXPERIENCE

Mastercard | *Django, **React**, **Python**, Redux, **Typescript**, PostgreSQL, SQLite, Ray* **Nov 2021 - Jul 2024**
Software Engineer II *Beijing, China*

- Built a **full-stack** business analytics platform ("Test & Learn") from the ground up for Chinese banks, enabling local deployment and data compliance, using Django (backend), **React**/Redux (frontend), and PostgreSQL/SQLite.
- Proposed and led migration from an in-house multiprocessing framework to Ray Core, enabling distributed execution across clusters and containerized environments with minimal code changes.
- Developed a high-performance outlier detection algorithm using statsmodels leave-one-out statistics; improved runtime **from 9 hours to 10 minutes** through selective computation and vectorization.
- Led the design and delivery of a Driver Summary module showing driver significance and visual summaries via React, Redux hashmaps, and Recharts; **collaborated with PMs and tech leads to refine product requirements and architecture**.
- Architected and implemented a Metric Uploader feature capable of processing **400MB+ CSV files in under one minute**, with row-level validation using a fully vectorized algorithm and comprehensive unit testing coverage.

Dazhangfang (Chinese Intuit) | ***SQL**, Redis, APScheduler, OCR, Flask, **Google Cloud*** **July 2018 - Oct 2021**
Python Engineer *Beijing, China*

- Maintained and enhanced the company's invoice and bank form recognition system and finance/taxation APIs, enabling users to upload receipts for automatic recognition, classification, and accounting.
- Managed and deployed a **large-scale recognition platform (100,000 lines of code, 10 servers)** integrating the recognition engine, invoice verification service, and web service for recognized results.
- **Optimized database queries and indexing**, improving the Invoice Recognition Web Service performance by 99.99%, dramatically reducing response latency.
- Automated manual invoice verification, achieving a 90% reduction in human intervention using edit-distance algorithms for text matching and validation.
- Implemented asynchronous task scheduling and message delivery using APScheduler and Redis as a message queue broker, increasing throughput and reliability.
- Designed caching mechanisms for recognition results and optimized the end-to-end OCR pipeline, significantly reducing compute cost and improving system scalability.

PROJECTS

Sharded Distributed Database with Paxos + 2PC | *Python, DistAlgo, SQLite*

- Built a configurable N-cluster, M-node sharded database with Multi-Paxos consensus.
- Implemented automatic shard map generation supporting dynamic cluster scaling (tested 3-9 clusters).
- Designed Two-Phase Commit (2PC) for cross-shard atomic transactions with WAL-based rollback
- Implemented dynamic resharding via hypergraph partitioning to minimize cross-shard overhead

AgentBusters – Financial AI Benchmark & Agent Security (Berkeley AgentBeats) — Ongoing

- Role: Team Lead / Software Engineer; Tech: Python, FastAPI, LLMs, Multi-Agent Systems, MCP, LangChain
- Leading a 5-member team building a dual-agent adversarial evaluation system for AI financial analysts.
- Integrating BizFinBench.v2 (29K+ Q&A pairs) and designing Alpha Score for reasoning robustness.
- Developing FastAPI services and MCP servers for real-time SEC and Yahoo Finance data access.
- Designing TherapyTrap, an adversarial agent security scenario, for the AgentBeats-Lambda challenge.
- Analyzing prompt injection and LLM tool-use vulnerabilities (LangChain CVE).