Gan Xu

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EDUCATION

- MS, Computer Science, Washington University in St. Louis GPA: 3.41 (Expected) Jan 2021
- BS, Computer Science & Mathematics, University of North Carolina at Chapel Hill Major GPA: 3.64 Dec 2017

TECHNICAL SKILLS

- **Programming languages:** (Python, Java, Swift, Shell, JavaScript, HTML, CSS, C/C++)
- **Framework and Tools:** (Git, Flask, Docker, Spring Boot/MVC, Node.js, NoSQL, MySQL, MongoDB, Angular, React, SLF4J)
- **Related Coursework**: Algorithms, Artificial Intelligence, Data Structures, Files and Databases, Operating System, Internet Services & Protocols, Machine Learning, Bayesian Methods in Machine Learning, Multi-Agent Systems, Wireless Sensor Network, etc.

WORK EXPERIENCE

Washington University **Saint Louis, MO**

Graduate Research Assistant *Feb 2019 to present*

- Proposed innovative method to improve the communication performance over unreliable networks for distributed multi-agent algorithms, including message split and reconstruction, customized RUDP protocol, and forward error correction.
- Collaborated with Raytheon BBN Technologies on DAPRA funded projects, details available upon approval.

University of North Carolina **Chapel Hill, NC**

Assistant Bioinformatic Analyst - Full-time *Feb 2018 - Aug 2018*

- Introduced scripts to pull big data(GB per entry) from public biological databases, store and maintained with **MySQL**.
- Set up work environment on cluster with SLURM workload scheduler. Migrated old workflows from **LSF** platform to **SLURM**.
- Designed and optimized workflow pipeline for I/O and CPU heavy job, reduced **50%** idle time for some experiments.

PROJECTS

Distributed Agent Workflow Scheduling with Distributed Constraint Optimization

Java, *Maven*, *Kafka*, *Jenkins*, *SLF4J* *May 2019 to present*

- Mapped workflow scheduling problems to be solved by distributed constraint optimization(**DCOP**) framework.
- Built a real-time messaging system for distributed agents based on **Apache Kafka**.
- Deployed maximum gain messaging(**MGM**) algorithm which allows agents to coordinate and make optimal workflow schedules.
- Created APIs based on the need of other modules in the project to access optimization functions and results.

Multi-Room Chat Server(Web Application) **Github**

JavaScript, *Node.js*, *HTML*, *CSS*, *MongoDB*, *Socket.IO* *Jun 2020 to Aug 2020*

- Designed a real-time multi-room chat server using **Node.JS** and **Socket.IO**.
- Implemented both client-server and chat-server to realize the functions, saved chat history with **MongoDB**.
- Automated system deployment with **Docker**, and operated the online application on an **AWS EC2** Instance to improve the performance and make good management of the application.

Smart Pet Feeder **Github**

Assembly, *Shell*, *Python*, *C*, *AWS IoT/EC2* *Sep 2019 - Dec 2019*

- Designed and prototyped an automated pet food dispenser based on low power programmable wireless devices.
- Deployed **AWS IoT** to receive data, send instructions and allow easy scheduling and dispensing of pet food from cloud.
- Implemented facial recognition with **SVM** algorithm for pets identification. On RPi 3, the system is able to train model with limited sized samples within minutes and distinguish pets identity within **1s** with onboard CPU with trained models.
- Designed machine learning algorithms combined with IoT sensors to monitor pet feeding habits and detect abnormal situations.

Pysbatch **Github**

Python, *SLURM*, *UNIX*, *Linux*, *Twine* *Aug 2017 to Dec 2017*

- Implemented a python library wrapping UNIX/Linux system calls and **SLURM** command. The library enables users to set up complicated pipeline workflows using only python functions and avoid Shell script.
- Provided simplified options for users to set job dependency relations and limit concurrent jobs by pre-set user quota.
- Packaged and released on PyPI and conda-forge platforms, downloaded over **2000** times.