# Gan Xu

6640 Washington Ave, #2N, St. Louis, MO 63130 | 984-888-6951 | gan.xu@icloud.com | Ganxu.science | Github

## EDUCATION

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

## TECHNICAL SKILLS

- **Programming languages:** Python, Java, Shell, Go, JavaScript, HTML, CSS, C/C++
- **Framework and Tools:** Git, Kafka, Docker, Flask, Spring Boot/MVC, Agile, NoSQL, MySQL, MongoDB, React, GraphQL
- **Related Coursework**: Algorithms, Artificial Intelligence, Data Structures, Databases, Operating System, Internet Services & Protocols, Machine Learning, Bayesian Methods in Machine Learning, Multi-Agent Systems, System Security, 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 allowing 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.

**Communication-Aware Distributed Constraint Optimization** **Github**
*Python, Distributed AI* *Mar 2019 to Aug 2020*
- Designed new messaging method reducing **50%** runtime for limited bandwidth and low computation power devices.
- Implemented customized application-layer **RUDP** for reliable performance, i.e. ACK and retransmission.
- Implemented application-layer **Reed-Solomon** error correction with to achieve robust network performance over highly erroneous networks. Retained similar runtime performance when simple TCP slows down 10x when bit-error-rate increase.

**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, Raspberry Pi* *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 with IoT sensors to monitor pet feeding habits and detect abnormal situations.