

Qimin Zhang

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EDUCATION

- **The Pennsylvania State University** State College, USA
Ph.D in Computer Science and Engineering Aug. 2019 – Jun. 2023(*expected*)
- **University of Chinese Academy of Sciences** Beijing, China
Master of Engineering in Computer Technology Sep. 2016 – June. 2019
- **Beihang University** Beijing, China
Bachelor of Engineering in Aircraft Airworthiness Sep. 2012 – June. 2016
Bachelor of Science in Applied Mathematics (minor)

SKILLS

- **Languages** C++, C, Python, Shell
- **Technical Skills and Tools** Machine Learning (scikit-learn, PyTorch), Bioinformatics (SAMtools, STAR, HISAT2, bedtools, etc.), Cloud Computing (AWS), Web Development (HTML/CSS/JS), Linux, Git, Docker

WORK EXPERIENCE

- **Laboratory Corporation of America Holdings (LabCorp)** Remote
Data Science Summer Intern May 2022 - Aug 2022

Predict gut metabolites from gut microbiome data using machine learning

- Developed a set of highly accurate data pipelines to predict gut metabolites and metagenome functions from gut microbiome data
- Managed to work on a Colorectal Cancer dataset and achieved all metabolites well predicted (using Spearman correlation coefficient as the metric)

AWS resource access control

- Developed a web application to enable the AWS resource access control and deployed to ECS
- Developed on service end to create IAM roles to access AWS resource (S3 and DynamoDB) and developed on front end to implement the user interface

RESEARCH EXPERIENCE

- **Bioinformatics Algorithms** Sep 2019 - Present
 - **Transcriptome assembly & bulk/single-cell RNA-seq data analysis**
Developed a C++ software Scallop2, a transcript assembler specifically optimized for paired-/multi-end RNA-seq data. Designed and implemented a dynamic programming algorithm and an enhanced consensus algorithm to improve 85.9% and 46.6% in precision comparing with two leading tools at the same level of sensitivity.
- **Applied Machine Learning** Sep 2017 - June 2019
 - **High-throughput Computing**
Evaluated machine learning techniques for predicting resource usage in high-throughput computing. Applied the density-based Clustering methodologies to minimize resource waste and reduce time, cores and memory consumption by 13.82%, 16.62%, 49.15%, respectively.
 - **Healthcare**
Explored machine learning techniques to biomedical problems. Extracted feature of sputum sound signals using wavelet transform algorithm. Implemented a BPNN model and improved the precision of detecting sputum to 84.53%.

• Distributed System

Feb 2020 - March 2020

◦ MapReduce

Implemented a map reduce framework based on gRPC and HDFS. Evaluated the performance on AWS instances. Studied the impact of two parameters, the number of Mapper units and the size of the shared buffers via which the Map and Reducer units communicate.

TEACHING EXPERIENCE

- CMPSC-465, Data Structures and Algorithms, Spring 2022
- CMPSC-465, Data Structures and Algorithms, Fall 2022

PUBLICATIONS

1. **Qimin Zhang**, Qian Shi, Mingfu Shao. Accurate assembly of multi-end RNA-seq data with Scallop2. *Nature Computational Science*, 2, 148-152, 2022.
2. **Qimin Zhang**, Nathaniel Kremer-Herman, Benjamin Tovar, Douglas Thain. Reduction of Workflow Resource Consumption Using a Density-based Clustering Model. *2018 IEEE/ACM Workflows in Support of Large-Scale Science (WORKS)*, pages. 1-9, Nov. 2018.
3. **Qimin Zhang**, Pei An, Shuquan Wang, Xiaoli Bai, Wei Zhang. Image-based Space Object Reconstruction and Relative Motion Estimation using Incremental Structure from Motion. *2018 IEEE CSAA Guidance, Navigation and Control Conference (CGNCC)*, Aug. 2018.
4. Yan Shi, Guoliang Wang, Jinglong Niu, **Qimin Zhang**, Maolin Cai, Baoqing Sun, Dandan Wang, Mei Xue and Xiaohua Douglas Zhang. Classification of sputum sounds using artificial neural network and wavelet transform. *International Journal of Biological Sciences*, 14(8): 938–945, 2018.
5. **Qimin Zhang**, Jieru Zhao, Shuquan Wang. Design of Motion Control System for Frog-Inspired Bionic Hopping Robot. *International Conference on Mechatronics and Intelligent Robotics*, Pages: 502-509, Nov, 2017.
6. Jieru Zhao, Yang Li, **Qimin Zhang**, Zhongcai Pei. Research on Gait and Control of Bionic Hexapod Robot *Proceedings of the 2017 International Conference on Artificial Intelligence, Automation and Control Technologies*, Pages: 1-5, April, 2017.
7. **Qimin Zhang**, Zihé Liu, Jieru Zhao, Shuguang Zhang. Modeling and attitude control of Bi-copter. *2016 IEEE International Conference on Aircraft Utility Systems (AUS)*, Pages:172 - 176, Oct, 2016.

TALKS

1. **Qimin Zhang**, Qian Shi, Mingfu Shao.
“Accurate assembly of multi-end RNA-seq data with Scallop2”
International Conference on Intelligent Systems for Molecular Biology (ISMB), HitSeq COSI, July, 2022.
2. **Qimin Zhang**.
“Accurate assembly of multi-end RNA-seq data with Scallop2”
Center for Computational Biology and Bioinformatics, Penn State University, Sep, 2022.

ACADEMIC SERVICES

- **Conference Reviewer** : RECOMB 2022, ISMB 2022, WABI 2021, ISMB/ECCB 2021, RECOMB 2021, ACM-BCB 2020, ISMB 2020, APBC 2020.