**Yujue Wang, M.S.**

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**PROFILE**

* 2+ years of Azure data lake development and management experience.
* 2+ years of multiple cloud data transfer development and management experience.
* 3+ years of working experience in bioinformatics, including website development, single-cell DNA whole genome sequencing (WGS) pipeline development optimization and implementation, and single nucleotide variations (SNVs) and short insertions and deletions (INDELs) from the next generation sequencing data annotating and classifying.
* 6+ years of working experience in finance (programming and project managing).

**SKILLS**

reading riding

Python, R, HTML, CSS, JavaScript, SQL, Bash, C, Delphi, Java, Perl, Flask, Django, jQuery, MySQL, SQLite, PostgreSQL, Mandarin Chinese (native speaker)

**PUBLICATIONS and WEBSITE DEVELOPMENTS**

Sun S\*, **Wang Y\***, Maslov AY, Dong X, Vijg J. SomaMutDB: a database of somatic mutations in normal human tissues. ***Nucleic Acids Res****.* 2022 Jan 7;50(D1): D1100-D1108. doi: 10.1093/nar/gkab914.

Zhao Y, **Wang Y**, Shi Y, Morrow B, *et al*. Chromatin regulators in the TBX1 network confer risk for conotruncal heart defects in 22q11.2DS. ***NPJ Genom Med***. 2023 Jul 18;8(1):17. doi: 10.1038/s41525-023-00363-y.

Dong X\*, Zhang L\*, **Wang Y**\*, Lee M., Maslov AY, Wang T, Gorbunova V, Vijg J. Identifying genome structural variations in single cells. In submission.

https://vijglab.einsteinmed.org/SomaMutDB/

<https://github.com/biosinodx/SCcaller>

<https://github.com/biosinodx/SCcaller3_PEA>

<https://www.vijglab.org/>

<https://srirajlab.com/>

https://yujuewangresume.net/

**WORK EXPERIENCE**

**GeneDx, Data Science Team,** MD, USA. Apr. 2022-Feb.2024 **Senior Data Engineer**

As a senior data engineer, I have been involved in multiple projects.

• Azure data lake project: GeneDx’s 2.8 PB exome and genome sequencing data lake. To build it from scratch I developed a data management system called Mocha. It will manage the ETL pipeline, and facilitate the data archival and retrieval. My role encompassed the comprehensive development of Python scripts for Mocha, database, front-end, back-end design and development, document automation updates, CI/CD with GitHub actions, as well as the design and execution of unit tests and function tests. Here is the tech stack of the Azure data lake: Python, Django, Bootstrap, jQuery, HTML, SQLite, PostgreSQL, and Azure cloud storage. The data lake is currently supporting multiple teams and projects in GeneDx.

• The cloud data send-out system: Automatically deliver clinical data to GeneDx's customers' cloud storage based on the requirements specified by Genetic Counselors. It supports various cloud storage options, including AWS S3, Azure cloud storage, Google Cloud Platform, sFTP, and Citrix Sharefile. Throughout this project, I collaborated closely with Genetic Counselors to gather their requirements, and subsequently, I developed the complete script and conducted unit tests and function tests. This project helps the Genetic Counselors to reduce the turnaround time for data requests from 1 month to 1 week.

• QC Service Project: The QC service is a web application functioning as the primary decision engine, utilizing defined metrics per Standard Operating Procedure and delivering decision outcomes. In this project, I designed the data module for the QC decision engine and developed the Restful API service using the FastAPI framework. This QC service serves as a critical step in the data processing pipeline of GeneDx.

• WGS in Cloud project: This project involves the development of GeneDx's new WGS pipeline within the AWS environment. I was fortunate to be involved in this project, where my responsibilities encompass managing data transfer operations between AWS S3 and on-premises storage systems. Leveraging Python scripting, I successfully implemented the IAM roles anywhere method, establishing a secure mechanism for the application to acquire temporary AWS credentials. Additionally, I effectively developed data transfers between AWS S3 and on-premises storage systems with AWS Boto3. It is the essential part of the WGS in Cloud project.

**Albert Einstein College of Medicine, Genetics Department,** *NY, USA.*Apr. 2019-Mar. 2022 **Programmer.**

As a programmer, I help the postdocs, professors, and labs with their projects.

* SomaMutDB is a website database that compiles all up-to-date available somatic mutation data in healthy tissues, including in-house and publicly available data. It provides multiple functions, such as data visualization, browsing, signature analysis, and data download. I designed the structure of the website system and programmed the front and back end. I implemented six mutation signature analyzing tools on the website. And I set up the MySQL database for it. The paper on this website database was published in Nucleic Acids Research. I am the co-first author.
* PEA (phasing, enhanced reference genome and assembly) method can identify genome structure variations (SVs) from single-cell WGS data. I designed and programmed the pipeline under the supervision of a postdoc. The paper on the PEA method was submitted to *Nature Methods*. I am the co-first author.
* SCcaller can identify SNVs and INDELs from single-cell sequencing data. I simplified the whole pipeline of SCcaller from 200 commands and almost 800 parameters per cell to just one command and four parameters per cell, reducing the IO by 92.8%. And I sped up the pipeline by ten times with the parallel running technic. I also fixed the bugs for the previous version in INDELs calling.
* I annotated and classified SNVs and INDELs identified from the WGS data in >1500 22q11.2 deletion syndrome patients into damaging LoF, damaging frameshift, damaging Missense, benign Missense, splice-disrupting, synonymous variants using multiple state-of-art algorithms, software, and public databases including VEP, Bystro, spliceAI, etc. under the supervision of a postdoc. I built an SQLite database for it. And I implemented multiple statistical tests based on the database, including Fisher’s exact test, binomial test, and variant-Set Test for Association using Annotation infoRmation (STAAR). The paper of the project is published on npj Genomic Medicine, and I am the second author.
* I expanded the DNA mapping pipeline’s availability from only for the human genome to 7 different species for one lab. And I implemented it for 48 samples of 6 different species for the lab.
* I built and maintained the lab websites for two professors on the wowchemy and WIX platforms.
* I developed an HPC job submission website for students and postdocs at Albert Einstein College of Medicine to facilitate their computational analysis.

**Albert Einstein College of Medicine**, **Genetics Department,** *NY, USA.*Jul. 2018-Apr. 2019, **volunteer and waiting for my H1b visa approval.**

As a volunteer, I helped postdocs to implement their analysis pipelines on HPC. And I learned the necessary knowledge (single-cell WGS sequencing, DNA mapping, variant calling, etc.) for optimizing the SNV caller for single-cell WGS data.

**China UnionPay Merchant Services Company, Ltd.**, Ufood Division, *Shanghai, China*. Dec. 2016-Nov. 2017, **Project Manager**.

Ufood provides solutions for restaurant management. As a project manager, I supervised 10 employees and managed the accounts of over 1000 different vendors. We designed applications for PC, tablets, and POS terminals, a website for restaurant management, in addition to creating customized WeChat accounts for vendors and customers to facilitate reservations, ordering, and payments.

**China UnionPay Merchant Services Company, Ltd.**, MIS-POS (merchant integrated system – point of sale) Department, *Shanghai, China*. May 2012-Nov. 2016, **Programmer**.

I worked with senior personnel of international companies (Vanguard, McDonald's, Yum, NBA Play zone, Bestseller, ZARA, Decathlon, etc.) to develop and implement their integrated payment system (IPS) for the Chinese market. IPS module is deployed on the computers of cashiers or vending machines to drive hardware and communicate with bank servers securely.

**EDUCATION**

**East China University of Science and Technology**, *Shanghai, China*, **M.S.**, Control Science and Engineering, Sep. 2007 - May 2012

**Tongji University**, *Shanghai, China,* **B.S.**, Electrical Engineering and Automation, Sep. 2003 – Jun. 2007

**AWARDS AND HONORS**

The employee of the Year in 2014 and 2015, China UnionPay Merchant Services Company, Ltd.