Yuanye Chi

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Education

- **Tufts University** *Medford, Massachusetts*
  M.S. in Computer Science; GPA: 3.8/4.0 *Sept 2020 – Present*
  Courses: *Algorithms, Networking, Software Testing, Statistical Bioinformatics in R, Computational Theory, Network Security, Machine Learning, Computational Biology, Software Engineering(in progress), Molecular Biology(in progress)*

- **Tongji University** *Shanghai, China*
  B.S. in Applied Chemistry; GPA: 4.4/5.0 *Sept 2016 – Jul 2020*
  Courses: *Data Structure, C/C++ Programming, Java Language Programming, Web Programming, Linear Algebra, Advanced Mathematics, Chemo Informatics, Biochemistry, Inorganic Chemistry, Organic Chemistry, , Analytical Chemistry, Physical Chemistry, Spectrometric Identification*

Experience

Research

Graduate Research Assistant *Mar 2022 - Present*

- *Tufts University*
  Bioinformatics and Computational Biology Research Group Supervised by Prof. Donna Slonim
  - **RNA-Seq analysis from scratch**: Analyzed preterm umbilical cord blood RNA-Seq dataset with several labeled conditions from scratch. Did alignment by two-pass STAR/RSEM. Made differential expression analysis by DESeq2/limma-voom. Applied DEG enrichment analysis and gene set enrichment analysis(GSEA) to find interesting pathways related to common preterm diseases.
  - **Customize leading edge analysis based on GSEA result**: Developed further leading edge analysis algorithm based on Resnik semantic score to find hidden connection among result pathways when lacking differential expression genes.

Research Assistant *Sep 2018 - Jun 2020*

- *Tongji University*
  Analytical Chemistry Laboratory Supervised by Prof. Peisheng Cong
  - **Rapid protein prediction based on near infrared spectrum(NIR)**: Developed an algorithm including spectrum preprocessing, automatic wavelength selection, coarse filtering by distances and partial least squares discriminant analysis(PLSDA). The whole algorithm is implemented in C# as well as corresponding graphical interface and other user-related functions. It is still used with a portable spectrometer in the lab.
  - **Formula extraction from natural flavor based on gas chromatography–mass spectrometer (GCMS)**: Developed an algorithm first align and check chromatography peaks and then compare related top 3 mass spectrometer signals. All possible components in complex natural flavors will be ranked by their scores. This algorithm gets a really low RMSE on sample data. Also, implemented a graphical user interface based on QT5 package.

Work

Software Develop Engineer *Feb 2021 - June 2021*

- *Tengwow, Inc.*
  Backend Development Team
  - **Order system development**: Designed and Implemented order system docking with Tencent SaaS API based on Springboot. The service is successfully rolled out to several enterprises.
  - **Testing function implementation**: Implemented daily testing on all APIs in order system based on Cucumber to eliminate hidden risks.

Research Intern *Jun 2019 - Sep 2019*

- *Palmap, Inc.*
  Indoor navigation algorithm R&D team
  - **Navigation algorithm optimization**: Optimized indoor navigation A star algorithm by leveraging stairs constraints and shrank 60% of the graph size on average.
  - **Server caching implementation**: Implemented Redis and CDN to successfully relieve server stress.

Projects

Bioinformatics

- **Ported and Restructured Mummichog(a high throughput metabolomics analyzer)** *Oct 2021 - Dec 2021*
  Tufts University; Solo Project
  - **Ported Mummichog from Python to R**: Ported Open-Source Project Mummichog from Python to R to find out target metabolic network from thousands of mass spectrometry data without a priori identification of metabolites like MS-MS analysis by doing module analysis and pathway analysis.
  - **Restructured Mummichog**: Used tidy data form to restructure program. Instead of handling various dictionaries and lists in Python, made operations on the same dataframe in R.

Computer Science

- **High Performance HTTPs Proxy** *Sept 2020 - Dec 2020*
  Tufts University; Group Leader
  - **Developed proxy by C**: Developed an Https proxy doing load balance, Ad filtering, content searching, rate limiting using C language.
  - **Added Advanced Features**: Implemented HashMap to do caching. Used Openssl to decrypt/encrypt SSL connection. Handled string processing by purely regex. Designed a p2p network to speed up fetching.
- **High School Mobile Exercising Platform** *Mar 2019 - May 2019*
  Tongji University; Solo Project
  - **Client Development**: Designed two client sides based on Android allowing 1)teachers to upload and review homework and 2)students to finish homework.
  - **Server Development**: Did Cleaning on questions in more than ten latest exercise books and store them into SQLite database. Utilized Java Spring as server.

Chemistry

- **Analyzing plasticizers content in plastic food packages using GCMS** *Mar 2018 - May 2018*
  Tongji University; Group Leader
  - **Prepared Samples**: Organized group members to collect dozens of food contact packages and prepared the samples by soaking in several kinds of food mimics.
  - **Quantitative analysis based on GCMS**: Measured release amount of DEHP, DBP and DEP by GCMS by comparing peak area with calibration curve.

Honors and Awards

- **Second-class Professional scholarship(10%)** *2018*
  Tongji University
- **First-class Scholarship for Outstanding Merit** *2019*
  Tongji University
- **Shanghai Innovation and Entrepreneurship Training Program** *2018*
  Shanghai Scitech Entrepreneurship Center
- **First-class Chemistry Experiment Invitation Competition(4th)** *2019*
  Shanghai Municipal Education Commission

Skills

- **Programming Languages**: R, Python, Java, C, SQL, Shell, JavaScript, HTML
- **Frameworks&Tools**:
  - **Bioinformatics**: STAR, RSEM, DESeq, Limma-voom, GSEA, ClusterProfiler
  - **Development**: Flask, Spring(boot), Cucumber, Git, PostgreSQL, MongoDB, SQLite, Docker
  - **Machine Learning**: TensorFlow, Keras
- **Chemical**:
  - **Experimental skills**: Operations in inorganic/organic/analytical/physical chemistry
  - **Instrumental skills**: Operation of Chemical instruments like GCMS, HPLC, various spectrometers, NMR, AES
  - **Spectral analysis**: Spectral analysis of infrared spectrum, UV spectrum, mass spectrum, NMR spectrum(1D)