Jun Zhang

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EDUCATION

Shandong University, Jinan, China *Sept. 2022 – Jul. 2026（Expected）*
Bachelor of Engineering in Software Engineering GPA: 86.43/100
Major courses： Advanced Mathematics (96); Linear Algebra (100); Advanced programming (Bilingual) (90); Data Structure (Bilingual) (92); Crowd Science and Network Industry (Bilingual) (98)
Research interests： Methylation analysis; Machine learning and deep learning; Single-cell and spatial transcriptomics; Medical image analysis; Multimodal data analysis

RESEARCH EXPERIENCE

Prediction of RNA Modifications using Nanopore Direct RNA Sequencing Reads **Jinan, China**
Research Assistant, Research Center of Software and Data Engineering *Jun. 2023 – Present*

- Processed all raw Nanopore Fast5 files, including base calling, re-squiggle operations, and signal-level analysis, with methylation site information fully extracted.
- Extracted important features for RNA modification data through read alignment and signal segmentation.
- Conducted site-level analysis of RNA methylation data, achieving accurate prediction of methylation sites.
- Applied multimodal deep learning to improve the accuracy of RNA methylation prediction, resulting in an average accuracy improvement of 3% compared to EpiNano, providing a valuable tool for enhanced prediction.

Prediction of EGFR Mutation Status in Lung Cancer Patients based on Clinical Data **Jinan, China**
Research Assistant, Advanced Medical Research Institute *Jul. 2024 – Present*

- Collected and processed multi-modal clinical data, including routine blood test results, CT images, and EGFR mutation status information.
- Developed an ensemble learning model to predict EGFR mutation status, utilizing algorithms such as Support Vector Machines (SVM), Random Forest and Gradient Descent.
- Applied cross-validation techniques and predictive performance for model evaluation and validation.
- Evaluated the performance of the deep learning model with dataset from an independent hospital.

Multi-omics analysis of Biological Features of Spaceflight Across different Organs **Jinan, China**
Research Assistant, Advanced Medical Research Institute *Jul. 2024 – Present*

- Collected transcriptomics and proteomics data from NASA GeneLab, performed batch correction for sample integration.
- Analyzed transcriptomics of spaceflight (FLT) and ground control (GC) groups to recognize spaceflight-associated RNAs across multiple organs including liver, spleen, muscle, kidney and eye.
- Performed functional analysis such as GO, KEGG, GSEA and GSVA to identify critical pathways influenced by spaceflight.
- Integrated multi-omics data to assess specific organ-level effects of microgravity, validating key findings through experimental data.
- Identified tissue-specific spaceflight-associated RNAs/Proteins and integrated multi-omics data to serve as a reference to further understanding of biological features of spaceflight.

Integration of Spatial and Single-Cell Transcriptomics **Jinan, China**
Research Assistant, Advanced Medical Research Institute *Jul. 2024 – Present*

- Performed deconvolution analysis on spatial transcriptomics, revealing cell distribution and gene expression patterns across different spatial regions.
- Utilized Python packages like Scanpy for clustering of single-cell transcriptomics, then annotating cell types by the atlas annotations.
- Refined spatial transcriptomics data by aligning cell populations with spatially resolved gene expression, providing detailed insights into tissue composition.
- Integrated spatial and single-cell transcriptomics to investigate cell communication, trajectory inference and cellular plasticity measurement.

PROJECT EXPERIENCE

Solitaire Card Game **Jinan, China**

Designer *Mar. 2024 – May 2024*

- Technology Stack: Java, Swing, AWT
- This project involves creating a solitaire card game using object-oriented programming principles. The core of the project includes designing card and pile classes to represent different types of card piles (e.g., tableau piles, suit piles, deck pile, and discard pile). The project emphasizes key OOP concepts such as encapsulation, inheritance, polymorphism, abstract classes, and dynamic binding.

Hospital Medical Management System **Jinan, China**

Designer *Jun. 2024 - Aug. 2024*

- Technology Stack: Java, SpringBoot, mybatis, shiro, bootstrap, thymeleaf
- This Healthcare Management System is designed to optimize drug inventory management in medical institutions by providing real-time monitoring, reducing waste, and ensuring accurate tracking of stock levels. It enhances efficiency through automated processes, supports full traceability of drugs, and safeguards sensitive medical data with strict access control measures.
- The system also manages vendor and customer relations, tracking sales and transactions while ensuring compliance and security. Overall, it aims to improve operational efficiency, reduce costs, and mitigate risks associated with drug mismanagement.

COMPETITION

The Chinese Mathematics Competitions **Jinan, China**

Second Prize in Shandong Province District *Aug. 2022*

- This competition assessed the students' knowledge of advanced mathematics, linear algebra, probability theory, and other related subjects.

National Professional Software Engineering "Blue Bridge Cup" Design Competitions **Jinan, China**

Third Prize in Shandong Province District *Apr.2024*

- This is an algorithm competition that tests the participants' algorithm and coding skills.

LEADERSHIP ROLES

Chunhui student Volunteer Teaching Club of Shandong University **Jinan, China**

Campus leader *Apr. 2023 - Apr. 2024*

- Led various community initiatives, including organizing fundraising events and charity sales, and overseeing volunteer teacher training programs.
- Established a new volunteer teaching center in Zhangjiajie and successfully completed the first teaching mission in the region.

School of Software Think Tank, Shandong University **Jinan, China**

Head of scientific research department *Apr. 2024 - Present*

- Coordinated research seminars and shared insights on research methodologies and experiences with peers.
- Compiled and edited a comprehensive orientation guide for incoming freshmen.
- Organized a 21-day coding challenge to foster continuous learning and engagement among students.

HONORS & AWARDS

- Scholarship: School Aesthetic Education Scholarship *Sep.2023*
- First Prize in University Landscape Project Award *Dec.2023*
- Outstanding Individual in University Social Practice *May 2024*
- Outstanding University Practice Report *May 2024*
- Outstanding University Practice Team *May 2024*

RESEARCH SKILLS

- Programing Languages: Python, R, SQL, C++, Java.
- Python Packages: Pandas, Matplotlib, Scipy, Numpy, Scanpy, Pandas, pysam, ont-fast5-api, PyTorch, cellpath, Scikit-learn.
- Software & Tools: Guppy, Excel, HTML, IGV, VScode, Rstudio, PyCharm.
- Biology Analysis Expertise: scRNA analysis(primarily using the Scanpy)
  Spatial transcriptomics analysis
  Machine learning for biology
  Functional enrichment analysis: GO, KEGG, GSVA, GSEA
  Clustering and dimensionality reduction techniques for biological data