Hanbei Xiong

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EDUCATION

University of California, Los Angelas — Los Angelas, USA

Master of Science in Biostatistics — 10/2023-Present

Courses:
Biostat 200A: Methods in Biostatistics A
Biostat 216: Mathematical Methods for Biostatistics
Biostat 203A: Introduction to Data Management and Statistical Computing
Public Health C201: Fundamentals of Public Health

University of California, San Diego — La Jolla, USA

Bachelor of Science, Major in Applied Mathematics, Minor in Computer Science — 10/2019-06/2023

Major GPA: 3.84/4.0, **Cumulative GPA:** 3.66/4.0
Core Courses: Applied Linear Algebra, Mathematical Statistics, Computational Statistics, Introduction to Numerical Analysis, Analysis of Partial Differential Equations, Advanced-Data Structures, Design and Analysis Algorithm, Software Engineering, Recommender Systems and Web Mining, Machine Learning, etc.
Honors: Provost Honor (Every Quarter), Diamond Challenge 2018

PUBLICATION

- First Author – Hanbei Xiong et al. ***Analysis and Prediction of Monkeypox Confirmed Cases Using Arima and LSTM: A Comparative Study***. Published on Second International Conference on Biological Engineering and Medical Science (ICBioMed 2022).

RESEARCH EXPERIENCE

Histone Modification Prediction using ChIP-Seq Data — La Jolla, USA

Student Researcher — 09/2022-Present

Instructor: Wei Wang, Professor of Chemistry and Biochemistry, Professor of Cellular and Molecular Medicine
Leading an individual project to discover number of motifs in the DNA-sequence pattern with neural network and fit a global linear model to predict Histone Modification regions.

- Preprocessed and combined with normalization on over 100 cell lines and tissues ChIP-Seq data of H3K27AC histone marks from ENCODE database
- Reproduced the model and given in *Neural network facilitated ab initio derivation of linear formula: A case study on formulating the relationship between DNA motifs and gene expression* and made necessary adjustments based on data format

Analysis of Microarray Gene Expression Research — Remote

Undergraduate Research Assistant — 04/2022-09/2022

Instructor: Jiebiao Wang, Assistant Professor of Biostatistics, University of Pittsburgh School of Public Health
Investigate the transcriptomic datasets like the Allen Human Brain Atlas (AHBA) and design innovative machine learning models to predict the exact location of the brain areas in MRI-derived stereotactic space using microarray gene expression data

- Conducted literature review on image transcriptomics and gene expression analysis
- Compared and embedded multiple non-linear feature selection methods to preprocess AHBA gene expression data
- Realized the newly published brain region parcellation pipeline described in literature *Standardizing Workflows in Imaging Transcriptomics with Abagen Toolbox* on AHBA and evaluated the necessity of this parcellation by comparing the results with our model

Epidemic Diseases Time Series Forecasting — Remote

Undergraduate Research Assistant 03/2022-09/2022

Instructor: Shuangge Steven Ma, Interim Department Chair and Professor of Biostatistics; Affiliated Faculty, Yale Institute for Global Health
Investigated the plausible statistical methods to contribute to the ongoing epidemic diseases like COVID-19 and Monkeypox

- Independently got acquainted with the application of time series analysis in epidemiology in reality
- Contrasted the accuracy of the Long Short-Term Memory Neural Network (LSTM NN) and that of the conventional Autoregressive Integrated Moving Average model (ARIMA) in the epidemic application and constructed LSTM neural network to predict the growing pattern of the future Monkeypox infected patients worldwide
- Delved into the Skin Lesion image classification task and established a Multitask Contrastive Model to deal with commonly encountering imbalanced datasets in biological data

Optimal Transport Literature Review La Jolla, USA

Undergraduate Research Assistant 03/2022-06/2022

Instructor: Yuming Zhang, SEW Assistant Professor at UCSD's Mathematics Department (Past)

- Delved into *The Variational Formulation of the Fokker-Planck* and referred to its proof of the iterative scheme with the Fokker-Planck equation led by Wasserstein Metric
- Regularly discussing with the instructor about the principle of Fokker-Planck equation constructed by the author, the symbol use of the time-discrete scheme, the purpose of limiting specific variables before the proof, and the significance of the Partial Differential Equation formula utilized in the proof in the article

WORK EXPERIENCE

Department of Mathematics, University of California, San Diego La Jolla, USA

Reader 03/2022-06/2023

Math181A: Intro to Mathematical Statistics I
Math181B: Intro to Mathematical Statistics II
Math185: Intro to Computational Statistics
Math 170C: Introduction to Numerical Analysis: Ordinary Differential Equations

Yanyun Data Co., Ltd. Beijing, China

SDE Intern, the R&D Department 07/2021-09/2021

- Involved in establishing the first version of "Car Detection" mobile application on Android and took charge of the App upload
- Utilized MySQL to clean data and implemented API for visualizing processed data and matching up registered Username and Password from the dataset

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

Eta Omega Chi La Jolla, USA

Chair of the Professional Department 09/2021-06/2023

- Planned and organized academic-related activities, such as internal simulated stock trading competitions, simulated business contests, scholar lectures and seminars, etc.
- Gave lectures to pledgees about academic research as undergraduate research assistants

UCSD Social Tennis Club La Jolla, USA

A*ctive Member* 09/2021-06/2023

- Played and trained tennis with team members, and represented UCSD to attend tennis competitions with teams from other colleges

SKILLS & INTERESTS

- **Languages:** English (Fluent), Mandarin (Native)
- **Computer Languages:** R (Experienced), Python (Experienced), SAS (Experienced), MATLAB (Experienced), Bash (Experienced), Java (Experienced), C/C++ (Beginner), Microsoft Office (Beginner), JavaScript (Beginner), HTML/CSS (Beginner), MySQL (Beginner), Stata (Beginner)
- **Frameworks and Tools:** SpringBoot, React, Git, Linux, IntelliJ, Android Studio, VS Code
- **Research Interests:** Machine Learning, Genomics, Statistical Methods
- **Hobbies:** Go, Saxophone, Tennis, fitness