YUNUO WANG

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EDUCATIONAL BACKGROUND

Huazhong University of Science and Technology (HUST) Sep 2021 - Jun 2025
School of Life Science and Technology, major in Bioscience ***Major Ranking: 1/45; GPA: 92/100 (4.63/5.00)***
Core courses: Multivariable Calculus, Probability and Statistics, Linear Algebra, Bioinformatics, Medical Physics, Biomedical Signal Processing

University of Pennsylvania Aug 2023 - Jan 2024
International Guest Student Program (IGSP) ***GPA: 4.00/4.00***
Core courses: Statistics for Biologists, Introduction to Python for Data Science

PUBLICATION

- **GAN-Based Architecture for Low-dose Computed Tomography Imaging Denoising** accepted by the 2nd International Conference on Machine Learning and Automation **(CONF-MLA)**.

ACTIVITIES & RESEARCH EXPERIENCES

GAN-Based Architecture for Low-dose Computed Tomography Imaging Denoising Mar 2024 - Nov 2024
Research assistant, Mentor: James Choi, Imperial College London

- Analyzed GAN-based denoising techniques, including **cGAN, CycleGAN, and WGAN** for low-dose CT imaging, assessing their effectiveness in enhancing image quality while maintaining diagnostic accuracy.
- Identified key challenges in clinical translation, such as robustness and problems in artifact reduction, and proposed future directions to optimize GAN models for precision medicine applications in radiology.

COVID-19 CT Scan Classification Using CNN Models Mar 2024 - Apr 2024
Individual Project, Mentor: James Choi, Imperial College London

- Preprocessed 2,481 RGB SARS-CoV-2 CT scans for binary classification of COVID-19.
- Built multi-layer **CNN** with Adam optimizer, and **ResNet-50** models in **PyTorch** with 5-fold cross validation and used Weights and Biases for efficient training supervision and hyperparameter tuning.
- ResNet50 outperformed traditional CNNs with residual connections, achieving over **0.95** accuracy and **0.98** AUC on the test set.

Metagenomic Analysis of Colorectal Cancer Datasets Identifies Cross-Cohort Microbial Diagnostic Signatures and A Link with Choline Degradation Feb 2023 - Jun 2023
Individual Project, Mentor: Weihua Chen

- Performed **metagenomic analysis** on 764 samples from 7 cohorts, classified in colorectal cancer, adenoma, and healthy control groups, using MetaPhlAn2 for taxonomic classification and HUMAnN2 for functional annotation.
- Utilized **Lasso regression** for feature selection to identify significant microbial markers, and developed robust predictive models for colorectal cancer using **Random Forest**, ensuring generalizability across cohorts.
- Achieved over **80%** accuracy in predictive models trained on combined datasets through Leave-One-Dataset-Out (LODO) validation, highlighting the enhanced predictive power of taxonomic features over functional features.

Updating GMrepo Database from V2.0 to 3.0 Nov 2023 - Aug 2024
Core Member, Mentor: Weihua Chen

- Utilized Kingfisher software to acquire data and metadata, followed by MD5 verification to ensure data integrity.
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- Conducted a quality assessment of raw sequencing reads using FastQC to ensure reliability of sequencing data.
- Microbiome Sequencing Data Analysis
- Used QIIME 2 for visualizing 16S data to assess quality; performed DADA2 or Deblur denoising, followed by species annotation using the SILVA classifier; calculated relative abundance of bacteria at different taxonomic levels based on the taxonomy of ASVs.
- Employed Trimmomatic for quality control and trimming of WGS data, Bowtie2 for host sequence removal, MetaPhlAn 4 for community analysis, and mOTUs 3 for species abundance analysis.

Summer Research of Theoretical Neuroscience Jul 2022 - Aug 2022
Mentor: Guillaume Hennequin, University of Cambridge

- Developed **Leaky Integrate-and-Fire (LIF)** neuron models to systematically analyze firing patterns and neuronal responses across varying input conditions, with modular code architecture supporting simulations of

both isolated neurons and interconnected networks.

- Conducted parameter optimization and stability analysis, incorporating advanced visualizations to evaluate spiking behavior and validate model fidelity against theoretical predictions.

AWARDS & PRIZES

- China National Scholarship (top 0.2% highest honor for undergraduates) October 2022
- Bronze Award in the Chinese College Students' Entrepreneurship and Innovation Competition July 2022
- Merit Student,Huazhong University of Science and Technology October 2021

SKILLS

- Software and Programming Tools: Python, R, MATLAB, Linux, SPSS, LaTeX.
- Machine Learning: PyTorch, TensorFlow, Keras, Transformer, OpenCV, Scikit-learn, Seaborn, Statsmodels.
- Bioengineering: Medical Imaging Processing, Metagenomic Analysis & Database Management