

Hanyu Wang

Homepage | GitHub

Email : hanyv.wang@yale.edu, hanyv.wang@gmail.com

OVERVIEW

I am currently a final-year undergraduate student doing a double major in Statistics and Quantitative Biology at the University of Toronto (UTSG). My research interest is Environmental Epidemiology (especially in infectious disease). During my undergraduate studies, I have focused on theoretical foundations and applications of Gaussian Processes and Machine Learning, with an emphasis on probabilistic modeling and data-driven prediction. I have an ultimate goal of providing actionable insights for disease prevention and risk mitigation by integrating epidemiological modeling, environmental data analysis, and advanced statistics.

EDUCATION

- | | |
|---|--|
| <ul style="list-style-type: none">• Yale University Master of Science• <i>Epidemiology of Infectious Diseases - Quantitative Specialization</i> | New Haven, America
<i>Start in Sep 2025</i> |
| <ul style="list-style-type: none">• University of Toronto Honours Bachelor of Science• <i>Statistics Major, Quantitative Biology Major, Mathematics Minor</i> | Toronto, Canada
<i>Sep 2022 - Jun 2025</i> |
| <i>Courses:</i> Machine Learning (R & Python), Time Series Analysis (R), Multivariate Data Building (R), Experimental Analysis (R), Population Ecology (R), Computer Programming (Python) | |

SKILLS SUMMARY

- **Technical Skills:** R (Seurat, custom pipelines), Python (Scanpy, scikit-learn)
- **Data Analysis:** Machine Learning (Logistic Regression, Random Forest, LDA), Statistical Modeling (PCA, UMAP, GMM), Data Visualization (t-SNE, UMAP)
- **Domains:** Epidemiological Modeling, Biomedical Informatics, Public Health Analytics

WORK EXPERIENCE

- | | |
|--|---------------------|
| Multifactorial Compartmental Model for Infectious Disease Dynamics | May 2024 - Aug 2024 |
| • <i>Research project conducted under the supervision of Prof. Jianhong Wu@York University</i> | |
| <ul style="list-style-type: none">◦ Developed an optimized SEIRS compartmental model with birth, death, and immune decay factors, incorporating stochasticity and spatial dynamics to simulate disease transmission.◦ Enhanced expertise in mathematical modeling and computational simulations, contributing to public health informatics research.◦ Collaborated with a team of four to refine model accuracy, improving technical communication skills. | |
| Single-Cell Transcriptome Sequencing Data Analysis | Sep 2024 - Dec 2024 |
| • <i>Remote research project conducted in the Biological Diagnosis and Treatment Center@Xibei Hospital</i> | |
| <ul style="list-style-type: none">◦ Analyzed single-cell transcriptome data to study gene expression in enteritis, identifying 10 cell subtypes from 19 clusters for downstream therapeutic insights.◦ Built R pipelines using PCA, Louvain/Leiden clustering, and Scanpy/Seurat libraries; visualized results with t-SNE and UMAP.◦ Strengthened skills in biomedical data analysis and machine learning, supporting health informatics applications. | |

ACADEMIC PROJECT

- **Identifying Autism-Specific Brain Connectivity Patterns | University of Toronto | Jan - Apr 2025** [view]
 - Built a predictive model for autism diagnosis with 92.5% accuracy, analyzing ABIDE fMRI data using PCA, UMAP, and Gaussian Mixture Models.
 - Uncovered distinct connectivity patterns, advancing knowledge in computational neuroscience and health informatics.
 - Presented findings to peers, enhancing scientific communication skills.
- **Prediction for Alzheimer's Disease Risk and Progression | University of Toronto | Sep – Dec 2024** [view]
 - Designed a machine learning diagnostics model that achieved 94.59% accuracy using Logistic Regression, Random Forest, and Naïve Bayes.
 - Improved model performance with hyperparameter tuning (grid search), k-fold cross-validation, and SMOTE for data balancing.
 - Gained proficiency in feature engineering and optimization, applicable to biomedical data challenges.

PUBLICATIONS

- **Reactivating T cell immunity in Wnt-hyperactivated non-small cell lung cancer through a supramolecular droplet of carnosic acid and peptide**
Na Liu, Y. Tu, Hanyu Wang, X. Zheng, F. Ji, M. Geng, X. Wei, J. Xin, W. He, Q. Zhao, T. Liu.
Journal of Pharmaceutical Analysis, DOI: 10.1016/j.jpha.2025.101309, 2025