

Hanyu Wang | Curriculum Vitae

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EDUCATION BACKGROUND

🎓 University of St Andrews

Research Topic: Bayesian Inference, Clustering, Uncertainty quantification
Doctor's Degree in Statistics (Ph.D.)

St Andrews, Scotland, UK

Sept. 2022 - Present

🎓 University of Southampton

MSc., Data and Decision Analytics
GPA: 75.58/100, with Distinction

Southampton, England, UK

Sept. 2020-Dec. 2021

🎓 Southwest Jiaotong University (project '211' institute)

BSc., Mathematics and Applied Mathematics
GPA: 82.02/100, Top 33%

Chengdu, China

Sept. 2016-Jun. 2020

🎓 Sichuan University (project '211' and '985' institute)

Joined a one-year exchange programme in the School of Mathematics

Chengdu, China

Sept. 2017-Aug. 2018

SUBMITTED / UNDER REVIEW MANUSCRIPTS

- Wang, H., Tsinda, E. K., Dunn, A. J., Chikweto, F., & Zemkoho, A. B. (2025). Primer C-VAE: An interpretable deep learning primer design method to detect emerging virus variants. arXiv preprint arXiv:2503.01459. Available at: <https://doi.org/10.48550/arXiv.2503.01459>.

PROFESSIONAL EXPERIENCE

University of St Andrews

Doctoral Researcher

St Andrews, Scotland, UK

Sept. 2022- Present

- Teaching Assistant at the School of Mathematics and Statistics
- Ph.D. Student Rep at Stats Division from 2023 to 2025.
- Organize the PhD Statistics Reading Group supported by Statistics Seminar fund.
- Mentor in Piscopia's Mentorship Scheme for 2 students who are in the honors year.

University of Southampton

Research Assistant in Machine Learning

Southampton, England, UK

Oct. 2021-Sept. 2022

- Analyzed the gene sequences of different variants of SARS-CoV-2 and built a deep learning model using TensorFlow for variant classification and primer design.
- Presented a [poster](#) on this subject at the UK Operational Research Society's 63rd Annual Conference, and also gave a talk within the school's SIAM-IMA Student Chapter Seminar Series.
- (Update: Due to infectious disease regulations, PCR wet lab experiments for SARS-CoV-2 could not be completed. The model was reconstructed in 2025 to enhance its applicability for multi species)

Chengdu Yuedong Information Technology Co. Ltd (CODOON)

Algorithm Intern—Hardware Division

Chengdu, China

Sept. 2019-Dec. 2019

- Developed a project based on wearable three-axis acceleration sensors attached to ankles, building algorithms to calculate steps, estimate exercise distance, intensity, calorie consumption, and METS, integrated with mobile applications and WeChat mini-programs to provide personal data analysis.

- Collaborated with team members on projects utilizing six-axis sensors (3 acceleration + 3 gyroscope) to achieve running posture recognition during exercise.
- Partially participated in and implemented bicycle cadence calculation projects based on three-axis acceleration sensors and Hall sensors.
- Applied for invention patent for the team: [CN201910961174.7](#)

RESEARCH EXPERIENCE

CORMSIS External Summer Project

Southampton, England, UK

Supported by University of Southampton and Tohoku University

Oct. 2021-Sept. 2022

Tutor: Dr. Alain Zemkoho / Dr Emmanuel Kagning-Tsinda

GitHub: [Primer C-VAE: An Interpretable Deep Learning Primer Design Method to Detect Emerging Variants](#)

- ▶ Developed a semi-automated method for the design of both the forward and reverse primer set for specific SARS-CoV-2 variants detection, the primer pairs are evaluated by in-silico PCR.
- ▶ Trained deep Convolution Neural Networks (CNNs) models with an accuracy higher than 98% to classify labeled SARS-CoV-2 variants and identify genomic features needed for the forward and reverse PCR primer design.
- ▶ Simulated maximum pooling and created another 2 novel methods to process feature extracting to generate the primers.
- ▶ (**Update:** Due to the inability to conduct wet lab experiments, the model was reconstructed in 2025 based on a Convolutional + VAE framework to enhance applicability for multi species)

Southwest Jiaotong University Summer Project

Chengdu, China

Supported by Southwest Jiaotong University

Oct. 2019- Jun.2020

Tutor: Associate Prof Meng Hua

GitHub: [Motion modal recognition based on machine learning methods](#)

- ▶ As a director designed a new method of feature extraction and recognition of human motion physics using machine learning based on LSTM and CNN, and the correct recognition rate reaches more than 95%.
- ▶ Design and conduct experiments to determine the optimal position of the sensor to be worn for the most efficient motion recognition.
- ▶ Combine hardware and software by rewriting the program in C++ and packaging it into an SDK that can be written to the motherboard.

University SRTP (Student Research Training Program)

Chengdu, China

Supported by Southwest Jiaotong University

May 2018- Apr. 2019

Tutor: Prof Hongtai Yang

GitHub: [A comparative study of traditional taxi and For-Hire vehicle based on big data](#)

- ▶ As a director of 5 people group, adopted statistics and mathematical methods to analyse and predict future developments using ArcGIS with actual geographic information, population distribution, religious, residential culture, and travel times.

Sichuan Provincial SRTP (Student Research Training Program)

Chengdu, China

Supported by Southwest Jiaotong University

May 2017- Apr. 2018

Tutor: Prof Zhiyun Guo

GitHub: [Research on the recognition and function of the enhancers in HMEC and MCF-7 cells](#)

- ▶ As a member to help identify the enhancer and enhanced target genes in human breast epithelial cells (HMEC) and human breast cancer cells (MCF-7). By exploring differences in the two cell enhancers, we provide a theoretical basis for further research on gene regulation and functional analysis of breast cancer cells.

CONFERENCE / SEMINAR PRESENTATIONS

- **Digital Health Science Seminars - University of St Andrews** 17 Dec. 2025:
Invited Talks: *Divide-and-Conquer techniques for Bayesian mixture models with evaluation of uncertainty*
- **RSS International Conference 2025** 1 - 4 Sep. 2025:
Invited Talk (Methods & theory section): Advancements in Divide-and-Conquer approaches for Bayesian nonparametric models.
- **BNP 14 - 14th International Conference on Bayesian Nonparametrics** 23 - 27 Jun. 2025:
Poster: Divide-and-Conquer Dirichlet Process mixture model for Uncertainty Evaluation in Large-Scale Clustering: Data Allocation and Cluster Structure.
- **SMMB Seminars - University of St Andrews** 07 Apr. 2025:
Ph.D. Talks: Detecting prevalent clusters with uncertainty evaluation during Divide-and-Conquer - Uncertainty in Bayesian cluster analysis
- **BAYSM 2024 - Bayesian Young Statisticians Meeting** 29 - 30 Jun. 2024:
Poster: A Divide-and-Conquer Dirichlet Process Mixture Model for Large Datasets.
- **Optimization & Machine Learning Seminars - University of Southampton** 15 Apr. 2024:
Invited Talk: Primer Design for Subspecies Detection: Enhancing Interpretability in Deep Learning Methods.
- **Stats Seminars - University of St Andrews** 03 Apr. 2024:
Ph.D. Talks: Using Distributed DPMM for Detecting Prevalent Clusters with Uncertainty Evaluation based on Post-processing MCMC.
- **Stats Seminars - University of St Andrews** 05 Apr. 2023:
Ph.D. Talks: Detecting Prevalent Clusters of Multimorbidity using Bayesian Mixture Modelling with Divide-and-Conquer Algorithm.
- **SIAM-IMA Seminars - University of Southampton** 11 Oct. 2021:
Invited Talk: Machine Learning based Primer Design for PCR assays with Semi-auto Method.
- **OR63 - Operational Research Society's 63rd Annual Conference** 14 - 15 Sep. 2021:
Poster: Machine Learning based Forward Primer Design for the Detection of SARS-CoV-2 Emerging Variants.

AWARDS & ACHIEVEMENTS

- University of St Andrews - Interdisciplinary PhD Research and Travel Fund May. 2025
- ISBA-BNP14 Travel Award Feb. 2025
- University of St Andrews - St Leonard's College Postgraduate Travel Award Jun. 2024
- Santander Scholarship | Santander Development Fund May. 2024
- CSC-St Andrews PhD Scholarships Aug. 2023
- University of St Andrews - PGR Support Fund Nov. 2022