

# Hanyu Wang | Curriculum Vitae

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## EDUCATION BACKGROUND

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### 🎓 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

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- 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

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### 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

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### 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

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- **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

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- 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