# Hanpu Shen

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## EDUCATION

**09/2018 – 06/2022 | Southern University of Science and Technology (China)**
Major in Statistics and Data Science
*Department of Statistics and Data Science | Total GPA: 3.83/4.0 | Major GPA: 3.89/4.0*
*(Top 5% of Cohort)*
**Relevant Coursework:** Bayesian Statistics; Computational Statistics; Real Analysis; Statistical Linear Models; Mathematical Statistics; Probability Theory; Time Series Analysis; Ordinary Differential Equation.

**05/2021 - 03/2022 | King Abdullah University of Science and Technology (Saudi Arabia)**
*Department of Computer Science*
*(VSRP Research Student)*
Supervisor: Prof. Di Wang

**08/2021 - 12/2021 | National University of Singapore (Singapore)**
*Department of Statistics and Data Science*
*(NG Coursework and Research-Based Student)*
Supervisor: Prof. Dongming Huang
**Relevant Coursework:** High Dimensional Statistical Analysis.

**09/2022 - 06/2027 | University of California Irvine (United States)**
*PhD in Statistics, GPA:3.90/4.0*

## ACADEMIC RESEARCH

**08/2021 –05/2022 | Low Dimensional Representation of Shared Information in Idiosyncratic Cortical Topographies**
Supervisor: Prof. Dongming Huang, Department of Statistics and Data Science, NUS
Context: **Undergraduate Thesis Project**
Main Aims and Responsibility:

- Designed and constructed a novel functional alignment method for fMRI data, based upon Gaussian graphical models, called the idiosyncratic and shared response model (ISRM).
- Captured the group's shared and subject-specific low-dimensional linear representation, thus preserving the geometric structure of the fMRI data.
- Verified partial identifiability guarantees of ISRM. ISRM can efficiently disentangle the shared idiosyncratic representations, representing an interpretation advantage.
- Derived solutions of ISRM in closed form utilizing a constrained EM algorithm.
- Implemented the ISRM in Python, accelerated the computing process by utilizing parallel computing techniques.

**03/2022 - 12/2023 | From a Non-Convex Generalised Linear Model to a Neural Network in Differential Privacy Model**

Supervisor: Prof. Wang Di, Department of Computer Science, KAUST.

Context: **Submission to AAAI 2024.**

Main Aims and Responsibility:

- Constructed a convex surrogate loss function which upper-bounds the generalization error for monotonical and L-Lipchitz link functions over the constrained vector space.
- Developed a privacy-preserving ERM algorithm achieving the dimensional independent excess generalization error bounds $O(log^2(n) / \sqrt{n})$ for learning constrained non-convex DP-GLM through objective perturbation method.
- Applied the Neural Tangent Kernel technique to approximate the gradient descent training process for over-parameterized Deep ReLU networks; And obtained the first excessive population bound for the most prevalent algorithm DP-SGD on arbitrary layers neural network.

## HONORS & AWARDS

First Class of Merit - Student Scholarship (10/2021)
First Class of Merit - Student Scholarship (10/2020)
First Class of Merit - Student Scholarship (10/2019)

## TECHNICAL SKILLS

**Languages:** Python, R, MatLab, Java