

# WEI FUYANG

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## EDUCATION

Sun Yat-Sen University

Department of Mathematics

09/2018 - 06/2022

- Candidate for **Bachelor of Science in Statistics**; Overall GPA: 3.6/4.0

## RESEARCH

### **Construction and Optimization of Differential Gene Expression Network of Cancer Drug Resistance Based on ODE Models** (Ordinary Differential Equation) 06/2021 - 03/2022

Supervisor: Professor Sun Xiaoqiang, Sun Yat-Sen University

*Objective: to optimize the model in the paper "Differential Regulatory Network-based Quantification and Prioritization of Key Genes Underlying Cancer Drug Resistance Based on Time-course RNA-seq Data" by the way of data simulation, model optimization, development of new algorithms, etc.*

- Used multivariate time series methods to generate more data for model building based on the obtained small datasets
- Discretized linear regression models, penalized the coefficients from a biological perspective, and constructed a new penalized regression model combining LASSO and Elastic Net

### **Research on Factors that Influence the Effectiveness of AIDS Treatment**

12/2020 - 01/2021

Supervisor: Associate Professor Yan Ying, Sun Yat-Sen University

*Objective: to use statistical methods to analyze the ACTG 175 dataset in R Package speff2trial.*

- Conducted Correlation Analysis to explore the relationships between 4 types of AIDS treatment and the number of CD4 T-cells
- Used Nonparametric Regression and statistical tests to perform curve fitting and Nonparametric tests on the above relationships
- Applied machine learning techniques such as Regression Tree and Random Forest to take into consideration other factors including age, sex, BMI, and identified two most influential factors

*The project received the highest score from the supervisor.*

## COMPETITION

### **Less Emissions on the Earth, More Homes for EDPs** (Environmentally Displaced Persons) 02/2020 **COMAP's ICM (Interdisciplinary Contest in Modeling)** - Successful Participant

*As the rising sea level caused by increasing carbon emissions threatens human life, especially people living on islands, we need to find solutions to relocate people and protect their cultural heritage.*

- Constructed a mathematical model based on the heat conduction equation to evaluate the sea level rise and predict the number of people at risk
- Used Regression Analysis and Principal Component Analysis to analyze the characteristics of receiving countries such as GDP, GNI and build a Points-Based Immigration System to choose appropriate countries
- Built an EDPs-Carbon Emission Autonomous Cycle System based on the emission-penalty mechanism and the dynamic system in Differential Equation to achieve an autonomous balance between the number of EDPs and carbon emission

## SKILLS

- C++ since 2018; R since 2020; Python since 2020