

# Yufan Zheng

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## EDUCATION

**NanFang College of Sun Yat-Sen University, Electrical and Computer Engineering**

Guangdong, China

Bachelor of Engineering

Sep 2018 - Jun 2022

- GPA 86.36/100 (3.53/5.0), Major in Computer Science and Technology.
- Core Courses: Advanced Mathematics (89), Data Structure and Algorithm (92), Discrete Mathematics (91), Data Principles and Applications (87).

## AWARDS AND PRIZES

- Provincial third prize, awarded by 2021 China Undergraduate Mathematical Contest in Modeling. Oct 2021
- Third price Scholarship, awarded by NanFang College of Sun Yat-Sen University. 2020 - 2021
- Nation Scholarship, awarded by Ministry of Education of the People's Republic of China. 2019 - 2020
- Second price Scholarship, awarded by NanFang College of Sun Yat-Sen University. 2019 - 2020
- Merit award paper in 2019 IEEE International Symposium on Product Compliance Engineering-Asia. Oct 2019

## PUBLICATIONS

### Peer-reviewed Journal Articles

- Zhan C, **Zheng Y**, Zhang H, Wen Q. Random-Forest-Bagging broad learning system with applications for COVID-19 pandemic[J]. IEEE Internet of Things Journal, 2021 (SCI Q1, 2020 IF: 9.936).
- Zhan C, **Zheng Y**, Lai Z, Hao T, Li B. Identifying epidemic spreading dynamics of COVID-19 by pseudocoevolutionary simulated annealing optimizers[J]. Neural Computing and Applications, 2020: 1-14 (SCI Q1, 2020 IF:5.606).

### Conference Papers

- **Zheng Y**, Zhen Q, Tan M, Hu H, Zhan C. COVID-19's impact on the box office: machine learning and difference-in-difference[C]//2021 16th International Conference on Intelligent Systems and Knowledge Engineering (ISKE). IEEE, 2021 (EI).
- Li J, **Zheng Y**, Hu H, Lu J, Zhan C. Predicting video game sales based on machine learning and hybrid based feature selection[C]//2021 16th International Conference on Intelligent Systems and Knowledge Engineering (ISKE). IEEE, 2021 (EI).
- Lin J, Tan M, **Zheng Y**, Wu K, Zhan C. Detection capability prediction based on broad learning system during the COVID-19 pandemic[C]//2021 16th International Conference on Intelligent Systems and Knowledge Engineering (ISKE). IEEE, 2021 (EI).
- Wu S, Hu H, **Zheng Y**, Zhen Q, Zhang S, Zhan C. The impact of COVID-19 on online games: Machine learning and Difference-In-Difference. CCF Conference on Computer Supported Cooperative Work and Social Computing. Springer, Singapore, 2021 (EI, accepted).
- Wu S, **Zheng Y**, Lai Z, Wu F, Zhan C. Movie box office prediction based on ensemble learning. IEEE Symposium on Product Compliance Engineering-Asia (ISPCE-CN). IEEE, 2019 (EI).

## RESEARCH EXPERIENCE AND ACADEMIC ACTIVITIES

### Huangpu Institute of Materials, Industrial Software Development Division

Algorithm Intern

Guangdong, China Mar 2022 - Present

Responsible for the improvement and predictive modeling of traditional industrial control using machine learning, deep learning, and other techniques to assist in algorithm design in industrial software development.

- Explored machine learning applications in healthcare and transportation with sensor development engineer and researcher, using artificial intelligence algorithms to develop medical monitoring and road condition detection system.

### NanFang College of Sun Yat-Sen University, Research Institute of Big Data and Artificial Intelligence

Research Assistant to Prof. Choujun Zhan (Artificial Intelligence)

Guangdong, China Mar 2019 - Mar 2022

I have three years of academic research experience studying with Prof. Zhan. Over this period, I have received full academic training, from literature survey and experimental design to paper writing and publishing. I have been working on Machine Learning, Deep Learning, Data Analysis, and Mathematical Modeling with applications in Epidemiology and Entertainment Media. I have achieved several academic achievements in both directions.

#### 1. Epidemiology and Medicine study.

Epidemic transmission is a complex system influenced by multiple factors. To help human better control epidemics, we conducted three research projects aimed at quantifying and predicting the transmission of diseases. (1) We proposed the

difference-in-difference model to quantify the impact of COVID-19 on the box office and online game players; (2) We improved an epidemiological model (SEIR-Migration) combining intercity migration networks to describe the intercity transmission of the COVID-19 pandemic in China, and proposed a pseudo-co-evolutionary simulated annealing algorithm to optimize the model; (3) We proposed an improved machine learning model named Random-Forest-Bagging broad learning system (RF-Bagging-BLS) to predict COVID-19 transmission and applied machine learning model in prediction for medical resource requirements.

The experimental results indicate that 1) COVID-19 has a significant negative impact on the box office and a significant positive impact on online game players; 2) We found that the epidemic features have a correlation and could help improve the prediction models fit for box office and online game players during the COVID-19 pandemic; 3) Our proposed SEIR-Migration is more accurate in predicting peak epidemics in each province, while the proposed optimization algorithm is more efficient; 4) The proposed RF-Bagging-BLS model predicts COVID-19 transmission with an 18.3% reduction in Mean Squared Error (MSE) compared to the best results in other machine learning models.

#### **Research achievement:**

- Wrote a paper named "Random-Forest-Bagging broad learning system with applications for COVID-19 pandemic", which has been published by IEEE Internet of Things Journal.
- Wrote a paper named "COVID-19's impact on the box office: machine learning and difference-in-difference", which has been published by 2021 16th International Conference on Intelligent Systems and Knowledge Engineering.
- Wrote a paper named "The impact of COVID-19 on online games: machine learning and difference-in-difference", which has been accepted by CCF Conference on Computer Supported Cooperative Work and Social Computing, 2021.
- Wrote a paper named "Detection capability prediction based on broad learning system during the COVID-19 pandemic", which has been published by 2021 16th International Conference on Intelligent Systems and Knowledge Engineering.
- Participated in a paper named "Identifying epidemic spreading dynamics of COVID-19 by pseudo-co-evolutionary simulated annealing optimizers", which has been published by Neural Computing and Applications Journal.

## **2. Entertainment media study: movie and video game.**

Predicting the operating trend of entertainment media helps publishers and investors adjust their strategies promptly to maximize profits, and we concentrate on analyzing and modeling box office and video game sales. We proposed a novel hybrid feature selection machine learning method (PCC-RFFS) to forecast video game sales. Comparisons of two feature selection methods show that the proposed method reduces MSE loss by 13.6% and 8.4%, respectively. In addition, we developed an ensemble learning box office prediction model, and the Gradient Boosting Decision Tree Model has reduced MSE loss by 33.8% compared to the Decision Tree Model.

#### **Research achievement:**

- Wrote a paper named "Predicting video game sales based on machine learning and hybrid based feature selection", which has been published by 2021 16th International Conference on Intelligent Systems and Knowledge Engineering.
- Wrote a paper named "Movie box office prediction based on ensemble learning", which has been published by IEEE Symposium on Product Compliance Engineering-Asia, 2019.

#### **CONFERENCE ACTIVITIES**

- Participated in the 2019 IEEE International Symposium on Product Compliance Engineering-Asia held in Hong Kong, China, and delivered an oral presentation. Oct 2019
- Best volunteer at International Conference on Neural Computing for Advanced Applications 2021 held in Guangzhou, China, assisted in the organization and conduct of academic conferences, led the group in preparing and commissioning conference site equipment, and coordinating conference site services. Aug 2021

#### **ADDITIONAL INFORMATION**

##### **Research Interests**

My main interest lies in machine learning, deep learning, data mining, and time series modeling with their applications in different areas, including:

- Time series analysis and prediction modeling for public health, healthcare, entertainment media, and industry.
- Decision optimization of epidemic prevention measures based on machine learning and epidemiological modeling.

##### **Language Skills**

English (College English Test 6, CET6), Preparing for the IELTS test.

##### **Computer Skills**

Python (PyTorch, Scikit-learn, Numpy, Pandas, Matplotlib), MATLAB, C, Git, Linux, LaTeX.