

# YUFAN (BRUCE) ZHANG

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## EDUCATION

### Duke Kunshan University (DKU) / Duke University Dual Degree

Aug 2019 – May 2023

*B.S. in Data Science (by DKU)*

Kunshan, China

*B.S. in Interdisciplinary Studies (Subplan: Data Science, by Duke)*

- Cumulative GPA: 3.76/4.0 | Major GPA: 3.91/4.0
- Selected as Teaching Assistant for COMPSI 201 (Data Structures) and ECON 101 (Economic Principles)
- Dean's List: Spring 2021, Spring 2022 (with Distinction)
- Key Courses: Programming and Data Structures A+, Algorithms and Databases A, Discrete Math A, Principles of Machine Learning A, Data Acquisition and Visualization A, Cloud Computing A+, Calculus A+, Linear Algebra A-, Probability and Statistics A

## RESEARCH EXPERIENCE

### Blockchain Network Analysis, SciEcon CIC (an NPO registered at the UK)

Aug 2022 – Nov 2022

*Supervisors: Prof. Luyao Zhang (Asst. Prof. of Economics) and Dr. Yulin Liu (Chief Scientist at SciEcon CIC)*

- Conducted statistical and social network analysis (core-periphery structure analysis) on over 2 million transaction records from six popular DeFi protocols, resulting in a novel framework for comparing DeFi's levels of decentralization cross-sectionally
- Built and streamlined a data pipeline using Google BigQuery to query and process transaction data from the Ethereum blockchain, achieving a 200X speedup by using BigQuery SQL and simplifying the network analysis and data visualization workflow
- Publication: **Zhang, Y.**, Chen, Z., Sun, Y., Liu, Y., & Zhang, L. (2022). Blockchain Network Analysis: A Comparative Studies of Decentralized Banks. [Accepted by SAI Computing Conference 2023]

### GAN-based Few-shot Stylized Multilingual Font Generation, DKU

Jan 2022 – Jul 2022

*Supervisor: Prof. Peng Sun (Asst. Prof. of Data Science)*

- Proposed an end-to-end GAN-based model with PyTorch to generate stylized fonts in arbitrary languages in a few-shot learning manner
- Validated the model on a dataset of 858 fonts in 9 languages, achieving a 22% SSIM improvement over the SOTA method
- Designed a novel skip connection that improved the generated images in untrained languages by 19% as measured by user evaluation
- Publication: **Zhang, Y.**, Man, J., & Sun, P. (2022). MF-Net: A Novel Few-Shot Stylized Multilingual Font Generation Method. *Proceedings of the 30th ACM International Conference on Multimedia*. doi:10.1145/3503161.3548414

### Visualizing Non-Fungible Token Ethics, Data Science Research Center at DKU

Mar 2022 – Sep 2022

*Supervisors: Prof. Xin Tong (Asst. Prof. of Computation and Design) and Prof. Luyao Zhang (Asst. Prof. of Economics)*

- Created a Plotly Dash dashboard to visualize the price difference between CryptoPunks with differing ethical attributes such as genders
- Utilized SQL to query 16k+ transaction records and MySQL to build a database for CryptoPunks NFT.
- Conducted data analysis (distribution analysis & sentiment analysis) on 13+ million tweets regarding NFT's ethical issues
- Publication: **Zhang, Y.**, Chen, Z., Zhang, L., & Tong, X. (2022). Visualizing Non-Fungible Token Ethics: A Case Study On CryptoPunks. *ChinaVis 2022*. doi:10.48550/arXiv.2206.12922

### Using AlphaFold and GNN to Predict Catalytic Efficiency, DKU

Sep 2021 – Jun 2022

*Supervisor: Prof. Huansheng Cao (Asst. Prof. of Environmental Science)*

- Developed an end-to-end Graph Convolution Network (GCN) model with PyTorch to predict catalytic turnover numbers in *Bacillus subtilis* with AlphaFold structural representation, yielding a 14%  $R^2$  improvement over the SOTA method
- Performed Principle Component Analysis to reduce the dimensionality of 1.7TB of AlphaFold intermediate output data (PCA)

### CycleGAN-based Image Domain Transfer, Chinese Academy of Sciences

Jul 2021 – Aug 2021

*Supervisor: Prof. Shuhui Wang (Assoc. Prof. with Institute of Computing Technology, Chinese Academy of Sciences)*

- Enhanced the accuracy of CycleGAN's image generation by 67% by constructing a new category loss with PyTorch
- Produced a technical report after conducting a literature review on the state-of-the-art image domain transfer methods and datasets

## PUBLICATIONS & CONFERENCES

### MF-Net: A Novel Few-Shot Stylized Multilingual Font Generation Method

ACM Multimedia 2022

Yufan Zhang, Junkai Man, Peng Sun

DOI: 10.1145/3503161.3548414

### Visualizing Non-Fungible Token Ethics: A Case Study On CryptoPunks

ChinaVis 2022

Yufan Zhang, Zichao Chen, Luyao Zhang, Tong Xin

DOI: 10.48550/arXiv.2206.12922

### Blockchain Network Analysis: A Comparative Studies of Decentralized Banks

SAI Computing Conference 2023

Yufan Zhang, Zichao Chen, Yutong Sun, Yulin Liu, Luyao Zhang

Accepted

## SKILLS

- **Programming Skills:** Python, Java, SQL, C++, HTML5/CSS3/JavaScript, MATLAB,  $\text{\LaTeX}$
- **Machine Learning & Data Science:** PyTorch, Scikit-Learn, XGBoost, MySQL, PostgreSQL, Hadoop, Spark, Pandas, Numpy
- **Software & Web Development:** Flask, Django, Vue.js, Bootstrap, Heroku
- **Miscellaneous Technologies:** Data scraping, Data visualization (D3.js, Plotly), Linux, Git, Conda, Slurm, Docker, ArgoCD

## PROFESSIONAL EXPERIENCE

### Saint Laurent Consulting (on Amazon.com account)

Sep 2022 – Nov 2022

#### Business Intelligence Engineer Intern

- Built an end-to-end data solution of data transformation (RESTful APIs and Python-based ETL) and backend database (PostgreSQL)
- Automated retrieval of daily COVID-19 data from the CDC and the calculation of the risk exposure of all Amazon fulfillment locations
- Integrated an order tracking web application with an existing inventory management system using Flask and MySQL

### SciEcon CIC (an NPO registered at the UK)

Oct 2021 – Present

#### Chair of Creativity and Innovation

- Built static websites leveraging Bootstrap and MkDocs and deployed the websites on Inter Planetary File System (IPFS)
- Developed and executed brand communication strategy across all platforms (digital multimedia, branding materials)
- Coordinated the SciEcon Lab Incubator Programs with over thirty students engaged in exploratory research.

### CompSci 201 Teaching Team, DKU

Jan 2021 – Mar 2021

#### Teaching Assistant

- Lectured 120 min-lab sessions on data types and arrays and held office hours to troubleshoot bugs in 30+ students' programs
- Developed 5 Java programming exercises covering object-oriented programming and data structures in the online judge system

### Office of China Enrollment Management, DKU

Sep 2020 – Jun 2021

#### Student Assistant

- Utilized Python and Excel to document, clean, and analyze graduation results from 80+ high schools in China
- Arranged campus tours and admissions information sessions for more than fifty Chinese guests

## SELECTED PROJECTS

### COVID-19×Twitter | *Twitter Sentiment Analysis on COVID-19 Related Topics*

Spring 2022

- Used PySpark to evaluate the extent that verified users have benefited from the pandemic to increase their number of followers
- Designed and implemented an information retrieval and classification system for sentiment analysis on Twitter

### Higher Education Evaluator | *Evaluating Higher Education Levels with Machine Learning*

Spring 2021

- Built a higher education level classifier based on Back Propagation Neuro Network and Particle Swarm Optimization with Python
- Analyzed the sensitivity and stability of the model and demonstrated the overlap between the results and the real results was 85.71%

## LEADERSHIP & SERVICE

### DKU Home | *Co-Chair of DKU Home (Kunshan High-Tech Zone)*

Aug 2020 – Dec 2020

- Scheduled and orchestrated weekly volunteering activities with another co-chair
- Hired weekly volunteers for volunteering activities at DKU Home (High-Tech Zone)

### Crazy Chinese Club, DKU | *Co-Founder & Marketing Chair*

Sep 2019 – Sep 2020

- Co-founded the Crazy Chinese club, which assists international students in learning Mandarin and experiencing Chinese culture
- Produced pertinent materials such as posters to promote club activities, attracting 200+ participants from 30+ countries

### Student Media Center, DKU | *Member of the Creative Design Committee*

Sep 2019 – Sep 2020

- Participated in the design of 2 co-branded peripheral products between DKU and Suzhou Museum
- Assisted in the editing of the 2020 Duke Kunshan University orientation welcome videos

## ADDITIONAL INFORMATION

**Languages:** English (TOEFL iBT 110, GRE 326+3.5), Mandarin Chinese (native)

#### Honors and Awards:

- Meritorious Winner (MCM/ICM Contest in Modeling 2021)
- Silver Medal (iGEM 2021)
- Top 100 Team (Mainland China, L'Oréal 2021 Brandstorm)

**Interests:** tech gear, photography, digital arts, ultimate frisbee