TAIWEI WU

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EDUCATION

Institut Polytechnique de Paris, Data and Artificial Intelligence, M1 2024.9 - Now Shenzhen Technology University, Computer Science and Technology, Bachelor 2020.9 - 2024.6 President's Award (the highest scholarship at SZTU, only 0.3% of the undergraduate students were awarded)

PROJECT EXPERIENCE

A MIDI Retrieval System Based on MG2V

- Project Background: Representing words as embeddings is commonly used in NLP tasks. As music shares properties with text, representing music as embeddings could also enable retrieval systems. However, training music embeddings in common methods like skip-gram would significantly increase training time as data scales. An algorithm Music-Graph2Vec (MG2V) aims to reduce this time. Based on this algorithm, we plan to develop a system allowing users to upload MIDI files and receive song metadata through a web interface.
- Role: As the project lead, I initially collected relevant materials and selected the topic. I conducted the core development work and programming for the MG2V algorithm, and directed my group members to do experiments related to MG2V. We have had a paper accepted to ACM MM Asia 2023 conference and have been invited to attend the event in Taiwan. Currently, I am now building a web interface based on Flask to utilize MG2V for music retrieval.

An Outline On Wastewater-Based Epidemiology

- Project Background: Epidemic surveillance relies heavily on conventional clinical diagnostic test(CDT), but CDT' s capacity largely lags behind the demand and the presence of asymptomatic virus carriers undiagnosed by clinical surveillance. The reports of SARS-CoV-2 viral genome detection in sewage networks highlights the potential of wastewater-based epidemiology (WBE) as a promising global solution complementary to CDT. In this project, we summarized the technological evolution of WBE, currently used WBE techniques for the detection and quantification of the virus and the effectiveness of WBE in monitoring environmental viruses and predicting epidemics.
- Role: I am in charge of summarizing the use of WBE in epidemic prediction. I investigated past studies predicting epidemics based on WBE. I summarized the findings and scenarios of these modeling efforts and wrote a part of our review article.

PUBLICATION

Taiwei Wu, Jianhao Zhang, Lian Duan, and Yuanzhe Cai. 2024. Music-Graph2Vec: An Efficient Method for Embedding Pitch Segment. In Proceedings of the 5th ACM International Conference on Multimedia in Asia (MMAsia '23). (See page 4)

Saier Fan, Qi Liu, Jieren Liu, Yuanzhe Cai, Taiwei Wu, Feijuan Huang. 2024. Opportunities and Challanges: an Outline of Wastewater-Based Epidemiology. Sci. Total Environ. // Work in process for Science of The Total Environment (JCR Q1, IF 9.8). (See page 9)

LEADERSHIP EXPERIENCE

ACM-ICPC Club of SZTU, Co-founder & Inaugural President

Our club mainly focuses on training members to take part in collegiate programming competitions, such as ICPC (International Collegiate Programming Contest). In 2020, I gathered a small group of 20 fellows to launch the club. Now we have nearly **800 members**, with around 200 people regularly attending each training session.

Through our collective efforts, the club has built a strong training program. It includes introductory coding workshops for newcomers as well as personalized training plans for more advanced members based on their competition goals. During the 2021-2022 academic year alone, members collectively earned 38 awards at the national collegiate programming contests. During my time leading the club, we organized six programming competitions across campus successfully. Participation grew from around 60 people initially to over 300 (unfortunately we had to hold an online qualifying round due to space issues). In the annual reviews by our university, our club has consistently been rated "Excellent" since we started.

2020.10 - 2022.10

2023.12 - 2024.4

2023.3 - 2024.5

Work Experience

University of Western Australia, Perth

ShenZhen Wemed Medical Technique Co., Ltd, *Algorithm Development Engineer* 2023.3 2024.4 For over a year, I have been employed part-time in this role, during which I led a research team of four individuals to develop the Music-Graph2Vec algorithm. This work culminated in the publication of a paper at the ACM MM Asia 2023 conference, where I was listed as the first author. Furthermore, I leveraged this algorithm to engineer a system capable of rapidly retrieving MIDI files, as described in "Project Experience". See page 14.

Visit

2023.7 - 2023.8

I was sent by my university on an academic exchange to UWA, where I resided with a host family and studied various engineering courses alongside UWA students. The experience proved to be tremendously valuable as an intercultural experience, as I was able to collaborate with students from all parts of the world on coursework assignments. Living in Australia also allowed me to learn firsthand about the local lifestyle. See page 15.

Awards

The First Prize of the National Final of RoboCom-CAIP Programming *	2022
RoboCom is a national competition held by Talent Exchange Center of Ministry of Industry and Information nology (MIITEC), recognized by the Ministry of Education of China. A total of 1126 competitors advanced to the the National Final, where I ranked 58th. See page 10.	Tech-
The Second Prize of the National Final of Lanqiao Cup C++ Programming Competition *	2023

"Lanqiao Cup" is one of the longest-running collegiate programming competitions in China. It is also a national competition recognized by the Ministry of Education of China. See page 11.

ident's Award [‡]	2022
The highest scholarship at SZTU (¥20000). Only 43 out of 13,000 undergraduate students received it. See page 12.	
The First Prize of Research and Innovation Award [‡]	2022

Granted by SZTU for my outstanding performance in the competitions. See page 13.

^{*}National award

[‡]University-level award