+61 (0) 456 428 835
Brisbane, Queensland, Australia
zeyu.xia@connect.qut.edu.au

Xia, Zeyu

IT student / Developer

github.com/xiazeyu
linkedin.com/in/xia-zeyu

Passionate and innovative undergraduate with outstanding learning skills, problem solving skills and strong performance ratings looking to gain additional education and experience by enrolling in a higher level program that will provide opportunities for growth and advancement.

Skills

Tools and Languages	Python(PyTorch), Linux, JavaScript (Vue)/HTML, Go, C/C++, AWS, Git, Docker, MarkDown, LaTeX
Mastered Skills	Data structures & Algorithms, Software design, Mathematical optimization & modeling
Communication Skills	English (IELTS 7.0/9.0), Chinese (Native)

Education

Bachelor of Software Engineering, *Jinling Institute of Technology* Jun. 2019 — Jun. 2023

- Average Score: 93.5/100, GPA: 4.14/4.5, Ranking 1/48
- Coursework: Building IT Systems, Programming Principle, Database Management, Rapid Web Development, Business in the Cloud, Management

Bachelor of Information System, *Queensland University of Technology* Jul. 2022 — Jun. 2023

- Coursework: Capstone Project, Enterprise Architecture

MicroMaster of Statics and Data Science, *Massachusetts Institute of Technology, Online* Feb. 2021 — 2023

- Coursework: Data Analysis, Machine Learning with Python, Statistics & Probability

Suzhou High School Jun. 2017 — Jun. 2019

Technical Experience

Research Assistant **Dec. 2021 — Present**
AI Lab of Software Engineering School *Nanjing, Jiangsu, China*

- We developed a scaled dot-product attention embedded CNN classifier for singing voice detection.
- We found that In CNN median layer, features with little information have equal weight as other features.
- Librosa was used to convert the waveform to log mel-spectrogram, then we implemented a baseline ResNet model using PyTorch.
- After that, we developed a scaled dot-product module to give weights to each feature.
- It shows that in all 64 feature maps extracted, our module remarkably decreased the influence of multiple less important channels, resulting 1.8% improvement of accuracy, and 1.3% improvement of F-measure.

Project Hoster **May 2021 — May 2022**
Undergraduate Research Opportunities Program: Research of aquaculture unmanned ship *Nanjing, Jiangsu, China*

- We developed an unmanned boat for shrimp farming.
- We aim to implement a solution including avoidance, formation, water monitoring, feeding, and IoT integration.
- PixHawk was chosen as the autopilot platform, we use Vector Field Histogram as the avoidance algorithm, then we designed the Plane System for formation.
- To implement water monitoring, feeding, and IoT, we programmed the STM32 MCU, giving it the ability to connect sensors and motors to our server on Alibaba Cloud.
- The outcome includes a functional ship, multiple patents, and national competition prizes.

Software Engineer **Aug. 2019 — Present**
Suzhou Mingguan Software Co, LTD. (List No. 691306) *Suzhou, Jiangsu, China*
Jiangsu Equity Exchange Center Technology Innovation Board Listed Enterprise

- I developed enterprise management solutions including virtualized working space, customer management system, offsite-data autonomy, and transparent VPN system.
- Virtualization platform was developed by KVM. A high available system was designed using TrueNAS Scale, L3 VPN was implemented by WireGuard to route subnets across multiple physically remote sites.
- The system achieved 99.9% availability in the past year.

Olympiad in Informatics Contestant **Aug. 2014 — Apr. 2021**

- I develop algorithms and write codes in this ACM-ICPC-like contest.
- Acquired knowledge includes:
- Data Structure: Linked List, Queue, Stack, Heap, Hash Table, Segment Tree, Trie Tree, Dict
- Algorithms: Brute-force, Greedy, Recursion, Dichotomous, divide-and-conquer, Dynamic programming, Simulation
- Graph Theory: Shortest Path, Spanning tree, Disjoint-set, Bipartite chart, Tarjan, LCA
- Number theory: Greatest Common Divisor, Least Common Multiple, Erichsen sieve method, exgcd, fast exponentiation, Equations of congruence

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Open source projects **Jan. 2015 — Present**

Github

- Author of live2d-widget.js: A out-of-box Live2D dynamic widget on web pages, written by JavaScript. **1.4k stars**. Webpack and Continuous integration were used to improve compatibility and workflow. Easy injection to the web page was implemented by modifying the DOM Tree through Shadow DOM. Lazy load and CORS were also implemented.
- Contributor of hexo: A blog framework, powered by Node.js. **34.4k star**. After a trace of the bug, I located its source and submitted a PR to solve the bug caused by unexpected filter input.
- Contributor of cmder: A console emulator on Windows. **23.4k star.** I submitted a PR written by Batch to enable checking of custom args.
- Contributor of hexo-blog-encrypt: An encrypt plugin for Hexo blog, written by JavaScript. **722 star.** I submitted a PR written to refactor the project by using Web Crypto API and remove jQuery dependencies. Security was also enhanced by adding salt, using PBKDF2 & SHA256 to derive keys, using AES256-CBC to encrypt data, and using HMAC to verify message authentication codes. Finally, I fine-tuned the sequence to improve compatibility for plugins like MathJax which depends on EventListener.

Activities

Publications

- Singing Voice Detection Based on Feature Attention Deep Neural Network[2] Submitted
- Singing voice detection algorithm based on a scaled dot-product attention embedded convolutional neural network[1] 2021

Competitions

- China Collegiate Algorithm Design Programming Challenge Contest National, Mar. 2022, **Silver Medal**
- China Robot and AI Competition National, Nov. 2020, **Team First prize**
- National Software and Information Technology Talent Contest Provincial, Nov. 2020, **First prize**
- Programming Ability Test National, Dec. 2019, **No. 1 among 1195 competitors**
- National Olympiad in Informatics National, Dec. 2015 & Dec. 2018, **Second prize**
- Jiangsu Olympiad in Informatics Provincial, Nov. 2014, **First prize**

Awards

- QUT International Merit Scholarship - Science University, May 2022
- Merit Student University, Oct. 2021
- Advanced Student of Competitions University, Oct. 2021
- Excellent Student Scholarship University, Dec. 2020

Intellectual Properties

- A multi-thread courier bill recognition software based on paddleOCR Software copyright (2022SR0573840)
- A delivery SMS pickup code extraction software based on MobileNet Software copyright (2022SR0574212)
- A private cloud-based job collection and analysis system Software copyright (2022SR0440287)
- An aquaculture water quality monitoring device based on Deep Learning Patent (202220826723.7, pending)
- An underwater shrimp swarm detection system based on Ultrasonic Deep Learning Patent (202220838647.1, pending)
- A singing voice detection system based on PyTorch Software copyright (2021SR1178933)
- A 3D simulation teaching software of animal cells Software copyright (2017SR378755)
- One-hand multi-joint recognition and interactive collaboration software Software copyright (2017SR378766)
- A visual recognition device and recognition method Patent (CN201711104508.6)
- A fingerprint recognition method Patent (CN201711112733.4)
- A method for a sweeping robot to establish cruising coordinate system Patent (CN201610917156.5)

References

[1] Gui Wenming, Zeng Yue, and Xia Zeyu. “Singing voice detection algorithm based on a scaled dot-product attention embedded convolutional neural network”. cn. In: *Proceeding of the 16th National Conference on Man-machine Speech Communication*. Xuzhou, Jiangsu, China, 2021, pp. 256–264.

[2] Gui Wenming, Xia Zeyu, and Gong Rubin. “Singing Voice Detection Based on Feature Attention Deep Neural Network”.