

# Ziqing Wang

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## EDUCATION

### Sun Yat-sen University

Bachelor of Engineering in Microelectronics

Sep 2018

Zhuhai

- GPA: 3.7/4.0, Major GPA: 3.9/4.0, Ranking: 9/79
- Main courses: digital circuit, analog circuit, python machine learning, advanced programming, microcomputer principle, Matlab

## RESEARCH EXPERIENCE

### Bug Injection in Cloud System

May 2022 - Present

Research Intern

- Joined Purdue University's summer research team to study bug injection algorithm.
- Converted the buggy source code into Abstract syntax tree, and use GNN algorithm to do data representation on AST.
- Finetuned the CodeBERT(MLM) to generate buggy source code that can be used to evaluate the performance of the famous automated programme repair tools in cloud system.

### Efficient Spiking Transformer Enable by Partial Information

Jul 2022 - Oct 2022

Team Leader

- Implemented self-attention mechanism in SNNs to leverage both self-attention capability and biological properties of SNNs.
- Inspired by the missing information mechanisms in the nervous system, I proposed an efficient spiking Transformer (EST) framework enabled by partial information.
- Our EST can outperform the state-of-the-art SNN model in terms of accuracy and the number of time steps on both Cifar-10/100 and ImageNet datasets. In particular, the proposed EST model achieves 78.48% top-1 accuracy on the ImageNet dataset with only 16 time steps.
- As the first author, *Efficient Spiking Transformer Enable by Partial Information* is under review at Science Advancement.

### Multi-density DBSCAN Clustering

Jan 2022 - Mar 2022

Team Leader

- Improved the existing DBSCAN parameter adaptive algorithm so that it can adapt two parameters at the same time and speed up this adaptive process.
- Proposed a new multi-density DBSCAN (AMD-DBSCAN) algorithm, which adapts multiple pairs of parameters for multi-density datasets, so that the algorithm can achieve excellent performance. The experimental results show that our AMD-DBSCAN improves accuracy by 24.7% on average over the state-of-the-art algorithm on Multi-density datasets of extremely variable density, while having no performance loss in Single-density scenarios.
- As the first author, *AMD-DBSCAN: An Adaptive Multi-density DBSCAN for datasets of extremely variable density* is published in DSAA2022 (CCF-C).

### Brain Inspired LSTM

Nov 2021 - Mar 2022

Research Intern

- Joined the HKUST brain-inspired research team to study SNN-related algorithms.
- In-depth study of the LSTM and SNN algorithms, focusing on individual LIF neurons to simulate LSTM neurons.
- Proposed the BioLSTM model, which takes advantage of the high performance of LSTM and the biological plausibility of SNN.

### Self-supervised Object Detection

Sep 2020 - Sep 2021

Main Member

- Dived into the self-supervised object detection project.
- Used MoCo, a contrastive learning model, as backbone to extract the high-dimensional features and used the clustering results of these features to achieve object detection.
- Proposed an novel DBSCAN clustering algorithm based on k-dimensional tree, which makes it possible to cluster billions of feature data by dividing small partitions.

## INTERNSHIP EXPERIENCE

### Allwinner Technology

Jul 2021 - Sep 2021

Software Develop Engineer Intern

- Realized a network streaming media system that can adjust video encoder parameters in real time by effectively combining multimedia software modules.
- Developed an automated software testing system to realize automated adjustable parameter testing of video encoding.
- Built a network transmission video decoding system using the udp, rtp, and rtcp protocols to meet the company's decoding time requirements.

### Guangzhou Shengkai Haojin Investment Management Co., Ltd

Jul 2020 - Sep 2021

Data Analysis Intern

- Skillfully used python to carry out data cleaning and abnormal value processing on millions of project data and completed visual analysis.
- Used python script to perform rapid data analysis and processing of nearly one million pieces of data from over 2000 projects.
- Optimized the company's ERP system UI interface and interactive logic using javascript.

## SKILLS & LANGUAGES

- **Skills:** Python, Java, Verilog, Javascript
- **Languages:** TOEFL (104), GRE (327), French (B2)