

ZHIYU NI

University of Southern California

Email: zhiyuni@usc.edu Tel: (+1)323-633-1447

EDUCATION

University of Southern California

Ph.D. *Electrical Engineering*

Advisor: Pierluigi Nuzzo

Los Angeles, United States

2022.8 - Present

University of Science and Technology of China (USTC)

B.S. *Physical Electronics*

Outstanding Graduates

Hefei, China

2018.8 - 2022.6

RESEARCH EXPERIENCE

Risk-Aware Cost-Effective Design Methodology of Logic Locking

2022.9 - present

Advisor: Prof. Pierluigi Nuzzo, USC

- The goal of this project is to propose a risk-aware IC locking methodology which enables systematic and efficient exploration of a large range of design alternatives via rigorous quantification of the achievable protection levels, residual risk, and their trade-offs with area overhead.
- By combining a set of locking primitives, it is possible to generate new constructions that outperform existing methods, used in isolation.

Finding adversarial robust graph lottery tickets

2023.1 - present

Advisor: Prof. Pierluigi Nuzzo, USC

- The goal of this project is to find an adversarially robust graph sparsification technique to address the problem that the performance of GLTs collapses against structure perturbation poisoning attacks.
- By iteratively applying ARGS, we found ARGLTs that are highly sparse yet achieve competitive performance under different structure poisoning attacks.
- We prune the perturbed adjacency matrix and the GNN weights by optimizing a novel loss function. Our evaluation showed the superiority of our method over UGS at both high and low-sparsity regimes.

Validation of Dual Readout Crystal Calorimeters

2021.8 - present

Advisor: Prof. Junjie Zhu, University of Michigan, Ann Arbor

- Maintained over 10000 C++ code lines on GEANT to simulate the generation and detection of Cerenkov light, and analyzed the output data using ROOT on Ubuntu.
- Took advantage of parallel computing on Umich Server Cluster (Condor) to split code reducing the time of obtaining results.

Low-power reflective communication RF tags design

2021.12 - 2022.6

Advisor: Prof. Yubo Yan, USTC

- Took advantage of lower power consumption characteristics of backscatter communication to reach long communication distance.
- Based on the unique negative resistance of tunnel diodes, designed a RF communication tag to achieve high-gain amplification of back-scattered signals.
- Independently finished the work of impedance matching, RF circuit simulation, PCB design and board debugging.

Digital Filtering Algorithm of Electronic Signal Waveform of HPGe

2020.12 - 2021.11

Advisor: Prof. Ping Cao, USTC

- Proposed an algorithm to improve the energy resolution of gamma ray spectrum measurement.
- Achieved the best energy resolution on HPGe detectors at 1275 keV.

WORK EXPERIENCE

iFlytek

Machine Learning Engineer Intern, *AI Research Institute*

Hefei, China

2022.2 - 2022.6

- Independently carried out machine translation tasks utilizing large mixed-language model (**LLM**) for seamless bidirectional translation among English, German, Italian, and Portuguese languages.
- Surpassed Google Translation by attaining a superior BLEU score, demonstrating exceptional translation performance.

PROJECTS

Immersive Remote Communication

2020.9 - 2021.6

Advisor: Prof. Weiping Li, USTC

- Led a team to design a remote communication system.
- Solved the communication problem between different generations by developing different hardware and software.

Fast Image Style Transformation

2020.9 - 2021.1

Advisor: Prof. Changqing Feng, USTC

- Compared image style transformation performance between traditional Fourier transform, Wavelet transform and neural network.
- Optimized neural network (based on VGG19) to accomplish real-time video style transformation.

SKILLS

Programming

Python, PyTorch, TensorFlow, C, Matlab, Unix shell, Assembly Language, L^AT_EX

TEACHING EXPERIENCE

Teaching Assistant, Design Thinking and Innovation

Fall 2021, Spring 2022

Teaching Assistant, Mechanics and Heat

Spring 2021

ACTIVITIES

Head of Swimming Association

Fall 2021

Vice President of Volunteer Association

Fall 2020, Spring 2021

HONORS AND AWARDS

USTC Outstanding Graduates

2022

USTC Silver Prize for Outstanding Student Scholarship

2021, 2020

National Inspirational Scholarship

2021, 2020, 2019