

# Zhenxin Alan Xiao

<https://www.zhenxinxiao.com>

(+86) 188-6810-6383 | alanshawzju@gmail.com

## EDUCATION

### Zhejiang University (ZJU)

Hangzhou, China

Double Major: B.Eng. in Computer Science and B.Eng. in Automation

Sep. 2016 – Jul. 2020 (expected)

- o Member of **Chu Kochen Honors College** (selects top 6% of students in ZJU)
- o **GPA**: 3.9/4.0, **Rank**: 1/20 (Three consecutive years)
- o **TOEFL**: 110 (Speaking: 27, Writing: 28), *MyBest<sup>TM</sup>* Scores: 114
- o Core Courses: Computer Vision (95), Numerical Analysis (94), Embedded System (94), Digital Logic Design (94), Computer Organization (93), Operating System (92)

### University of California, Los Angeles (UCLA)

Los Angeles, USA

[UCLA CSST Program](#), Research Intern at Department of Computer Science

Jul. 2019 – Sep. 2019

- o GPA: 4.0/4.0 (12 units)
- o Select 90 students out of 1000+ candidates from top-tier universities in China and Japan to conduct research.

## PREPRINTS & PUBLICATIONS

- o **Zhenxin Xiao**, Puyudi Yang, Yuchen Jiang, Kai-Wei Chang, and Cho-Jui Hsieh. (2019) BOSH: An efficient meta-algorithm for decision-based attacks. *arXiv preprint arXiv:1909.04288*. (Under review of ICLR'20) [\[link\]](#)
- o Yuchen Jiang, **Zhenxin Xiao**, and Kai-Wei Chang. (2019) Learning Directional Sentence-Pair Embedding for Natural Language Reasoning. *Published in AAAI'20 (SA)* [\[link\]](#)
- o Yuchen Jiang, Haihong Yang, **Zhenxin Xiao**, and Kai-Wei Chang. (2019) Learning Directional Sentence-Pair Embedding for Natural Language Reasoning. (Long Paper submitted to ACL'20) [\[link\]](#)
- o Zhou Zhao, Zhu Zhang, Shuwen Xiao, **Zhenxin Xiao**, Xiaohui Yan, Jun Yu, Deng Cai, and Fei Wu. (2018) Long-form video question answering via dynamic hierarchical reinforced networks. *Published in IEEE Transactions on Image Processing (TIP'19)*, 28(12):5939–5952. [\[link\]](#)
- o Zhu Zhang, Zhijie Lin, Zhou Zhao, and **Zhenxin Xiao**. (2018) Cross-Modal Interaction Networks for Query-Based Moment Retrieval in Videos. *Published in the 42Nd International ACM SIGIR (SIGIR'19)*. [\[link\]](#)

## RESEARCH EXPERIENCE

### INTERESTS:

- o **Machine Learning**: Adversarial Attack, Optimization
- o **Natural Language Processing**: Dialog System, Language Reasoning, Machine Translation
- o **Video-Language Joint Models**: Sign Language Translation, Video Question Answering

### Research Intern, Natural Language Computing Group, Microsoft Research Asia

Beijing, China

o Advisor: [Ming Zhou](#)

Oct. 2019 – Present

o Project: End to End Neural Sign Language Translation

- ✓ Built a demo program that can translate videos of sign language into spoken languages.
- ✓ Used Connectionist temporal classification (CTC) to align the video segments.
- ✓ Applied language models to assist the decoding of sign language.
- ✓ Achieved state-of-the-art performance on various publicly available datasets (e.g. PHOENIX14T).

### Research Intern, Computer Science Department, UCLA

Los Angeles, America

o Advisor: [Cho-Jui Hsieh](#), [Kai-Wei Chang](#)

Jul. 2019 – Sep. 2019

o Project: Adversarial attack for decision-based models

- ✓ Showed empirically that current decision-based attacks often converge to a local optimum.
- ✓ Designed an efficient meta-algorithm BOSH-attack, which improves existing hard-label black-box attack algorithms through Bayesian Optimization (BO) and Successive Halving (SH).
- ✓ Reduced the computation cost by 10x for both neural networks and discrete models (e.g. GBDT and detection-based defense models.)

- o *Project: Directional Sentence-Pair Embedding for Commonsense Causal Reasoning*
  - ✓ Proposed a new large-scale causal sentence pair dataset CER and analyzed the inadequate capability of current language encoder techniques at modeling directional inter-sentence relations.
  - ✓ Proposed a mutual attention mechanism and empirically demonstrated the effectiveness hereof.
  - ✓ Improved existing commonsense reasoning benchmarks by proposed approaches and corpus.

#### **Research Assistant, Digital Media Computing & Design Lab, Zhejiang University**

Hangzhou, China

- o Advisor: [Zhou Zhao](#) *Jul. 2018 – Jun. 2019*
- o *Project: Long-Form Video Question Answering (VQA)*
  - ✓ Devised a hierarchical structure that can encode the semantic meanings of long-form videos.
  - ✓ Employed a frame-level adaptive LSTM with a binary gate to segment a long video into small sections.
  - ✓ Used another LSTM to encode the videos in the section level, and adopted a highway network to control the information flow.
- o *Project: Query-Based Moment Retrieval in Videos*
  - ✓ Devised a syntactic Graph Convolutional Network (GCN) to leverage the syntactic structure of queries for fine-grained representation learning.
  - ✓ Proposed a multi-head self-attention to capture long-range semantic dependencies from video context.
  - ✓ Employed a multi-stage cross-modal interaction to explore the potential relations of video and query contents.

#### **Research Assistant, Robotics Laboratory, Zhejiang University**

Hangzhou, China

- o Advisor: [Rong Xiong](#) *Mar. 2018 – Jun. 2019*
- o *Project: Visual Place Recognition with Convolutional Neural Network-Based Descriptors*
  - ✓ Used a Faster-RCNN network to detect multiple bounding boxes and generate descriptors. Later, built an inverted index table for faster searching in the database.
  - ✓ Experimental results with multiple accessible datasets (KITTI, V4RL, etc.) suggested that the method is an effective approach to detect the loop closure.

## **SELECTED OPEN-SOURCE PROJECTS**

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### **MIPS Assembler/Disassembler** [\[code\]](#)

- o Converted MIPS constructions to binary codes or revert this process. (support nearly 200 MIPS instructions. )
- o GUI program available on all popular platforms like Windows and MacOS.

### **Operating System Design (MIPS SDK on C)** [\[code\]](#)

- o Developed an Operating System on FPGA-based hardware (supporting MIPS instructions).
- o Designed the complete fair schedule (CFS) for process scheduling, system calls, and loading user programs.

### **MiniSQL Database Engine** [\[code\]](#)

- o Implemented a SQL database engine using B+ trees and supported storing and loading of the data.
- o Simulated the MySQL database using minimizing codes (less than 2, 000 lines).

### **Book Management System** [\[code\]](#)

- o Used C# and UWP to design a GUI program of book management system for libraries.
- o Included new features (e.g. navigation bar, acrylic design) first introduced in Windows Fall Creator Updates 2017.

### **ROS Navigation Global Planner** [\[code\]](#)

- o Rewrote source code of ROS Navigation Global Planner Package to implement RRT and optimized A\* algorithms.

## **SELECTED AWARDS & SCHOLARSHIPS**

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- o First-Class Scholarship for Outstanding Students, Zhejiang University (top 2%), 2018 & 2019
- o **Silver Medal Winner (¥40000), China Datathon (Big Data Competition), 2<sup>nd</sup> out of 30+, Youngest Winner**
- o Provincial Fellowship, Zhejiang University (top 2%), 2018
- o First-Class Scholarship for Excellence in Research and Innovation, 2017 & 2018 & 2019
- o First Prize, Mathematical Contest in Modeling of Zhejiang University (Top 8 out of 150+), 2018
- o **First Prize, Chinese Physics Olympiad (Fujian) (Top 30 out of 10, 000+), 2015**

## **Extracurricular Activities**

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**Etiquette Team Manager**, Student Union in Chu Kochen Honors College

*Sep. 2016 – Jul. 2017*

**Photographer**, QiuShiChao Association, Zhejiang University

*Sep. 2016 – Mar. 2017*