

# Zhenxin Xiao

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## Education

### Zhejiang University (ZJU)

Hangzhou, China

Double Major: BSc. in Computer Science and BSc. in Automation

Sep. 2016 – Jul. 2020 (expected)

- o **Chu Kochen Honors College** (selects top 6% of students in ZJU)
- o Overall GPA: 3.9/4.0, Rank: 1/20
- 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 Overall GPA: 4.0/4.0
- o Selects 90 students out of 1000+ candidates from top-tier universities in China and Japan to conduct research in cross-disciplinary areas (program website: <https://www.csst.ucla.edu/summer-program-csst>)

## Preprints & Publications

**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.

Yuchen Jiang, **Zhenxin Xiao**, and Kai-Wei Chang. (2019) Learning Directional Sentence-Pair Embedding for Natural Language Reasoning. *34th AAAI Conference on Artificial Intelligence (AAAI'20 student abstract)*

Zhou Zhao, Zhu Zhang, Shuwen Xiao, **Zhenxin Xiao**, Xiaohui Yan, Jun Yu, Deng Cai, and Fei Wu. (2019) Long-form video question answering via dynamic hierarchical reinforced networks. *IEEE Transactions on Image Processing (TIP'19)*, 28(12):5939–5952.

Zhu Zhang, Zhijie Lin, Zhou Zhao, **Zhenxin Xiao**. (2019) Cross-Modal Interaction Networks for Query-Based Moment Retrieval in Videos. *In the 42Nd International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR'19)*.

## Research Experience

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

Beijing, China

- o Advisor: **Shujie Liu, Ming Zhou**
- o Project: *End to End Neural Sign Language Translation*
  - ✓ (Ongoing) Conduct experiments to solve the End to End Neural Sign Language Translation problem.

### Research Intern, Computer Science Department, UCLA

Los Angeles, America

- o Advisor: **Cho-Jui Hsieh, Kai-Wei Chang**
- o Project: *Adversarial attack for decision-based models*
  - ✓ Existing decision-based attacks which depend on iterative local updates often get stuck in local minimum points and fail to generate the optimal adversarial example with smallest distortions.
  - ✓ Propose an efficient meta-algorithm called BOSH-attack, which tremendously improves existing hard-label black-box attack algorithms through Bayesian Optimization (BO) and Successive Halving (SH).
  - ✓ Show empirically that the proposed algorithm converges to a better solution than existing approaches, while the query count is smaller than applying multiple random initializations by a factor of 10.
  - ✓ Conduct experiments to attack discrete and complex models, such as Gradient Boosting Decision Tree (GBDT) and detection-based defense models.

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

Hangzhou, China

- o Advisor: **Zhou Zhao**
- o Project: *Long-Form Video Question Answering*

- ✓ The existing work for Video Question Answering mainly focuses on short-form video question answering, due to the lack of modeling semantic representations from long-form video contents.
- ✓ Introduce a dynamic hierarchical reinforced network for open-ended long-form video question answering, which employs an encoder-decoder architecture with a dynamic hierarchical encoder and a reinforced decoder.
- *Project: Query-Based Moment Retrieval in Videos*
  - ✓ Introduce a novel framework called Cross-Modal Interaction Network (CMIN).
  - ✓ Devise a syntactic GCN to leverage the syntactic structure of queries for fine-grained representation learning.
  - ✓ Propose a multi-head self-attention to capture long-range semantic dependencies from video context. Next, employ a multi-stage cross-modal interaction to explore the potential relations of video and query contents.

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

Hangzhou, China

- Advisor: **Rong Xiong** Mar. 2018 – Jun. 2019
- *Project: Visual Place Recognition With Convolutional Neural Network-based descriptors*
  - ✓ Visual place recognition is a crucial part of loop closure algorithms in SLAM systems. Traditionally, researchers use unsupervised descriptors of images like SIFT, ORB, and BRISK. I propose a novel place recognition pipeline to generate descriptors and compare them with previous ones quickly.
  - ✓ Use a Faster-RCNN network to detect multiple bounding boxes corresponding to the natural objects in the image. Each bounding boxes is separately fed into a resnet-101 network to generate the descriptors. Later, I build an inverted index table for fast searching in the database.
  - ✓ The experiments results on multiple accessible datasets (KITTI, V4RL, etc.) suggest that my method is an effective approach to detect the loop closure pairs and improve the accuracy compared to traditional pipelines.

## Research Competitions & Projects

**China Datathon (Big Data Competition)**

Shanghai, China

*Silver Medal Winner (¥40000), Second Place of 30+ teams, Youngest Winner*

Nov. 2018

- Process national census data of China for the past 50 years (Millions of entries).
- Find that social mobility decreases as society develops, and one's education level is strongly related to the family background.
- Predict possible future trends of China's social mobility using Time-Series Analysis (LSTM, Hidden Markov Model, etc.).

**MIPS Assembler/Disassembler (Open-Source Project)**

Apr. 2018

- Convert MIPS constructions to binary codes or revert this process.
- Use QT (Python) as GUI design and support nearly 200 MIPS instructions. The project has been adopted by the *Computer Organization* course as an example project at Zhejiang University.

**Other Open-Source Projects:** MiniSQL (SQL database engine), Operating System on FPGA (Written in MIPS C and Assembly language), ROS Navigation Global Planner, FPGA-based Ball-Maze Game<sup>1</sup>

## Selected Awards & Scholarships

- First-Class Scholarship for Outstanding Students, Zhejiang University (top 3%), 2018
- Provincial Fellowship, Zhejiang University (top 2%), 2018
- Innovation Research Fellowship, Zhejiang University, 2017
- First Prize in 16<sup>th</sup> Mathematical Contest in Modeling of Zhejiang University (Top 8 out of 150+), 2018

## Extracurricular Activities

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

Sep. 2016 – Jul. 2017

QiuShiChao Association, **Photographer**, Zhejiang University

Sep. 2016 – Mar. 2017

<sup>1</sup> The codes of projects mentioned can be found at: <https://github.com/AlanShaw-GitHub>. All projects are completed on my own.