# Zhenxin Alan Xiao

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## EDUCATION

**Zhejiang University (ZJU)**                                                                                   Hangzhou, China
*Double Major: B.Eng. in Computer Science and B.Eng. in Automation (Robotics Track)*      *Sep. 2016 – Present*
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$^{TM}$* 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, **Zhenxin Xiao**, and Kai-Wei Chang. (2019) Learning Directional Sentence-Pair Embedding for Natural Language Reasoning. *(Long Paper summited 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, USA
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 (critical part in SLAM systems)*
- ✓ Used a Faster-RCNN network to detect multiple bounding boxes and generate Convolutional Neural Network-Based 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

**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

o First-Class Scholarship for Outstanding Students, Zhejiang University (top 3%), 2018 & 2019
o **Silver Medal Winner (twice, ¥80000 RMB in total), China Datathon (Big Data Competition), 2018 & 2019**
o Provincial Fellowship, Zhejiang Province (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

**Etiquette Team Manager**, Student Union in Chu Kochen Honors College      *Sep. 2016 – Jul. 2017*
**Photographer**, QiuShiChao Association, Zhejiang University      *Sep. 2016 – Mar. 2017*