Zhenxin Alan 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)*

- Member of Chu Kochen Honors College (selects top 6% of students in ZJU)
- Overall GPA: 3.9/4.0, Rank: 1/20
- Core Courses: Computer Vision (95/100), Numerical Analysis (94/100), Embedded System (94/100), Digital Logic Design (94/100), Computer Organization (93/100), Operating System (92/100)

University of California, Los Angeles (UCLA) Los Angeles, USA
UCLA CSST Program, Research Intern at Department of Computer Science *Jul. 2019 – Sep. 2019*

- Overall GPA: 4.0/4.0
- 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)*

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

- Advisor: **Shujie Liu, Ming Zhou** *Oct. 2019 – Feb. 2020*
- *Project: End to End Neural Sign Language Translation*
  - ✓ (Ongoing) Conducting experiments to solve an End to End Neural Sign Language Translation problem.

Research Intern, Computer Science Department, UCLA Los Angeles, America

- Advisor: **Cho-Jui Hsieh, Kai-Wei Chang** *Jul. 2019 – Sep. 2019*
- *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 the smallest distortions.
  - ✓ Proposed 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).
  - ✓ Showed 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.
  - ✓ Conducted 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

- Advisor: **Zhou Zhao** *Jul. 2018 – Jun. 2019*
- *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 for semantic representations from long-form video contents.
- ✓ Introduced a dynamic hierarchical reinforced network for open-ended long-form video question answering, which employs an encoder–decoder architecture with a hierarchical encoder and a reinforced decoder.

- *Project: Query-Based Moment Retrieval in Videos*
  - ✓ Introduced a novel framework called Cross-Modal Interaction Network (CMIN).
  - ✓ 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

- 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 simultaneous localization and mapping (SLAM) systems. Traditionally, researchers use unsupervised descriptors of images like SIFT, ORB and BRISK. I proposed a novel place recognition pipeline to generate descriptors and compared them with previous descriptors quickly.
  - ✓ Used a Faster-RCNN network to detect multiple bounding boxes corresponding to the natural objects in the image. Each bounding boxes were separately fed into a resnet-101 network to generate the descriptors. Later, I 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 pairs and improve 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*

- Processed national census data from China for the past 50 years (millions of entries).
- Found that social mobility decreases as society develops, and one's education level is strongly related to family background.
- Predicted 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*

- The MIPS assembler/disassembler is designed to convert MIPS constructions to binary codes or revert this process. It uses QT (Python) as GUI design and supports 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[1]

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 16th 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, Zhejiang University, **Photographer** *Sep. 2016 – Mar. 2017*

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