ZIYI WU

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EDUCATION

Tsinghua University, Beijing, P.R.China

Bachelor of Engineering in Automation   *Aug, 2017 – Jul, 2021 (expected)*

- **GPA: 3.9/4.0, Ranking: 2nd/173**

- **Chairman** of Spark Program, Tsinghua University

Core Courses

- **Mathematics**: Calculus A (4.0/4.0), Linear Algebra (4.0/4.0), Introduction to Complex Analysis (4.0/4.0), Probability and Statistics (4.0/4.0), Operations Research (4.0/4.0)

- **CS**: Computer Languages and Programming (4.0/4.0), C++ Program Design and Training (4.0/4.0), Data Structure and Algorithms (4.0/4.0), Computer Network and Applications (4.0/4.0), Fundamental Artificial Intelligence (4.0/4.0), Pattern Recognition and Machine Learning (4.0/4.0)

SCHOLARSHIPS & AWARDS

- **2020 Xiaomi Scholarship** (Highest scholarship in Tsinghua sponsored by Xiaomi Corp., **0.1%**)

- **2020, 2019 Tsinghua Innovation Award of Science and Technology** (Awarded to undergraduate students with excellent research potential, **0.2%**)

- **2019 Fang Chongzhi Scholarship** (Highest honor in the Dept. of Automation, **0.1%**)

- **2019 Tsinghua Spark Program Membership** (Top student program in academic research, **1%**)

- **2018 National Scholarship** (Highest scholarship awarded by the Chinese government, **< 0.1%**)

- **2018 Champion** in the 20th **Electronic Design Competition**, Tsinghua University (**1/120**)

- **2018 5th place** in the 1st **Artificial Intelligence Challenge**, Tsinghua University (**5/150**)

PUBLICATIONS & MANUSCRIPTS

1. **Ziyi Wu***, Yueqi Duan*, He Wang, Qingnan Fan, Leonidas J. Guibas. IF-Defense: 3D Adversarial Point Cloud Defense via Implicit Function based Restoration. Submitted to *International Conference on Learning Representations (ICLR)*. Under review. [arXiv]

2. Ziwei Wang, Jiwen Lu, **Ziyi Wu**, Jie Zhou. Learning Efficient Binarized Object Detectors with Information Compression. Submitted to *IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)*. Under review.

3. Ziwei Wang, **Ziyi Wu**, Jiwen Lu, Jie Zhou. BiDet: An Efficient Binarized Object Detector. Accepted by *2020 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. [arXiv]

4. Zimeng Tan, Yongjie Duan, **Ziyi Wu**, Jianjiang Feng, Jie Zhou. A Cascade Regression Model for Anatomical Landmark Detection. Accepted by *2019 Medical Image Computing and Computer Assisted Intervention (MICCAI) Workshop*. [Springer]

5. Zhanwei Xu, **Ziyi Wu**, Jianjiang Feng. CFUN: Combining Faster R-CNN and U-net Network for Efficient Whole Heart Segmentation. [arXiv]

RESEARCH INTEREST

Fields	3D Vision, Video Analysis, Efficient Inference, Unsupervised Learning
Methods	Deep Learning, Reinforcement Learning, Neural Networks, Information Theory

RESEARCH EXPERIENCE

Stanford University, CA, U.S.

Geometric Computing Group, Department of Computer Science   *May, 2020 – Oct, 2020*

Research Assistant, Advisor: Prof. Leonidas Guibas

Project: IF-Defense: 3D Adversarial Point Cloud Defense via Implicit Function based Restoration

- Summarized the effects of 3D adversarial attacks on point cloud into two aspects from a geometric perspective through comprehensive review of existing attack methods

- Proposed a novel defense algorithm for 3D point cloud which can simultaneously address the two attack effects via accurate surface recovery and optimization based point restoration

- Achieved state-of-the-art robustness against all existing attacks on five typical point cloud networks

Tsinghua University, Beijing, P.R.China

Intelligent Vision Group, Department of Automation   *Apr, 2019 – Apr, 2020*

Research Assistant, Advisors: Profs. Jiwen Lu & Jie Zhou

Project: BiDet: An Efficient Binarized Object Detector

- Applied binary neural networks (BNNs) in the object detection task to reduce storage and computational cost, which was the first attempt to the best of our knowledge

- Employed the Information Bottleneck (IB) method for redundancy removal to fully utilize the capacity of BNNs and learned sparse object priors to eliminate the false positives in prediction outputs

- Boosted the performance significantly for both one-stage and two-stage detectors while reducing the model size and inference time by more than $10\times$

Project: Learning Efficient Binarized Object Detectors with Information Compression

- Proposed AutoBiDet, an extension of BiDet that automatically adjusts the IB trade-off and utilizes class-aware sparse object priors to alleviate the false positives more effectively

- Outperformed BiDet by a sizeable margin on both PASCAL VOC and MS COCO datasets when combined with more backbones and detection frameworks

- Generalized the techniques used in AutoBiDet to improve other model compression methods including low-bit quantization and channel pruning to show the universality of our approach

PROGRAMMING SKILLS

Proficient	Python, PyTorch, C#, Markdown, LaTeX, Git
Familiar	Linux, C/C++, TensorFlow, Keras, MATLAB, HTML, etc.

LANGUAGE SKILLS

TOEFL iBT	109/120 (Reading 30, Listening 26, Speaking 23, Writing 30)
GRE	333/340+4.5/6.0 (Verbal 163, Quantitative 170, Analytical Writing 4.5)