

ZIYI WU

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EDUCATION

Tsinghua University, Beijing, P.R.China

Aug, 2017 – Jul, 2021 (expected)

- **Bachelor** of Engineering in the Department of Automation (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)
- **Programming:** 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), 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 achievements, **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 issued 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](#)

RESEARCH INTEREST

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

RESEARCH EXPERIENCES

Stanford University, CA, U.S. *May, 2020 – present*

Geometric Computing Group, Department of Computer Science

Research Assistant, Advisors: Profs. [Leonidas Guibas](#)

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

- Summarize the effects of 3D adversarial attacks on point cloud into two aspects from a geometric perspective through comprehensive review of existing attack methods
- Propose 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
- Achieve state-of-the-art defense results against all the attacks on five typical point cloud networks

Tsinghua University, Beijing, China *Apr, 2019 – Apr, 2020*

Intelligent Vision Group, Department of Automation

Research Assistant, Advisors: Profs. [Jiwen Lu](#) & [Jie Zhou](#)

Project: BiDet: An Efficient Binarized Object Detector

- Apply binary neural networks (BNNs) in the object detection task to reduce storage and computation cost, which is the first attempt to the best of our knowledge
- Employ the Information Bottleneck (IB) principle for redundancy removal to fully utilize the capacity of BNNs and learn sparse object priors to eliminate the false positives in the prediction output
- Achieve state-of-the-art performance when combined with 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

- Propose AutoBiDet, which is 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
- Outperform BiDet by a sizeable margin on both PASCAL VOC and MS COCO datasets
- Generalize AutoBiDet to boost the performance of other model compression algorithms including low-bit quantization and channel pruning to show the universality of our proposed techniques

PROGRAMMING SKILLS

Proficient	Python, PyTorch, C#, Markdown, L ^A T _E X, Git
Familiar	Linux, C/C++, TensorFlow, Keras, MATLAB, 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)