

# ZIYI WU

2# Zijing Student Apartment ◇ Tsinghua University ◇ Beijing, 100084, P.R.China  
(+86) 18810237672 ◇ [wuzy17@mails.tsinghua.edu.cn](mailto:wuzy17@mails.tsinghua.edu.cn) ◇ [dazitu616@gmail.com](mailto:dazitu616@gmail.com)

## EDUCATION

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**Tsinghua University**, Beijing, China

*Aug, 2017 – Jul, 2021 (expected)*

- **Bachelor** of Engineering in the Department of Automation (expected)
- **GPA: 3.91/4.0, Ranking: 2<sup>nd</sup>/173**
- **Bachelor** of Management in the School of Economy and Management (expected, second degree)
- **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), Signals and System Analysis (4.0/4.0), Numerical Analysis and Algorithms (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), Computer Principles and Applications (4.0/4.0), Fundamental Artificial Intelligence (4.0/4.0)

## SCHOLARSHIPS & AWARDS

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- **2019 Fang Chongzhi Scholarship** (Highest honor in the Dept. of Automation, **0.1%**)
- **2019 Tsinghua Spark Program Membership** (Top student program in the field of academic research in Tsinghua University, **< 1%**)
- **2018 National Scholarship** (Highest scholarship given by the government of China, **< 0.1%**)
- **2018 Champion** in the 20<sup>th</sup> **Electronic Design Competition** (Highest level competition in Tsinghua University in the field of **Electronic Engineering**)
- **2018 5<sup>th</sup> place** in the 1<sup>st</sup> **Artificial Intelligence Challenge** Group A2 (Top level challenge in Tsinghua University in the field of **AI**)

## PUBLICATIONS & MANUSCRIPTS

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- 1 Ziwei Wang, Jiwen Lu, **Ziyi Wu**, Jie Zhou. Learning Efficient Binarized Object Detectors with Information Compression. In submission to *IEEE Transactions on Pattern Analysis and Machine Intelligence*. Under review.
- 2 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](#)
- 3 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](#)
- 4 Zhanwei Xu, **Ziyi Wu**, Jianjiang Feng. CFUN: Combining Faster R-CNN and U-net Network for Efficient Whole Heart Segmentation. [arXiv](#)

## RESEARCH INTEREST

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**Fields**      Efficient Inference, 3D Vision, Point Cloud, Unsupervised / Self-supervised Learning

**Methods**    Deep Learning, Reinforcement Learning, Neural Networks, Information Theory

## RESEARCH EXPERIENCES

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**Tsinghua University**, Beijing, China

*Apr, 2019 – present*

*Intelligent Vision Group, Department of Automation*

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

**Project: Learning Efficient Binarized Object Detectors with Information Compression**

- Propose AutoBiDet, which is an extension of BiDet that automatically adjusts the information bottleneck trade-off and utilize class-aware sparse priors to alleviate false positives more effectively
- Outperform BiDet and achieve new state-of-the-art performance on large scale datasets under different structures
- Generalize AutoBiDet to other model compression methods including quantization, pruning and efficient architecture design to show the universality of the proposed method

**Project: BiDet: An Efficient Binarized Object Detector**

- Consider the problem of object detection for binary neural networks, which is the first attempt to the best of our knowledge
- Employ Information Bottleneck principle for redundancy removal to fully utilize the capacity of binary network and learn sparse object priors to concentrate posteriors on informative predictions
- Achieve state-of-the-art performance in various detection frameworks on large scale datasets comparing with existing binary neural network methods

**Tsinghua University**, Beijing, China

*Aug, 2018 – Apr, 2019*

*Intelligent Vision Group, Department of Automation*

Research Assistant, Advisors: Profs. [Jianjiang Feng](#) & [Jie Zhou](#)

**Project: A Cascade Regression Model for Cardiac Landmark Detection**

- Apply cascade method to achieve state-of-the-art cardiac landmark detection result
- Take the advantages of two structures that utilize global information and local context to get accurate and fast regression output
- Lay the foundation for weakly-supervised heart segmentation approaches in the future

## PROGRAMMING SKILLS

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**Proficient**            Python, Pytorch, C / C++, C#, Markdown

**Familiar**             Linux, TensorFlow, Keras, LaTeX, etc.

## LANGUAGE SKILLS

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**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)