YEZHEN CONG

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EDUCATION

Tsinghua University, School of Software Aug. 2017 – Jun. 2021 (Expected)

Bachelor of Engineering in Software Engineering

- **Overall GPA: 3.98**/4.00 (**Rank: 1**/81), Major GPA: **3.99**/4.00 (**Rank: 1**/81), scored **A+** (**Top 1%**) in 6 major courses
- **Selected Honors:** "12–9" Scholarship (**Top 1%** at Tsinghua University), National Scholarship in 2019 & 2020 (**Top 1%** at Tsinghua University), SenseTime Scholarship 2019 (**29** recipients selected from all Chinese undergraduates based on academic performance and potential in AI research)
- **Core Courses:** Calculus A (1)&(2) (A&A), Linear Algebra (1) (A-), Discrete Mathematics(1)&(2) (A+&A), Probability and Statistics (A), Programming Methodology (A-), Data Structure (A), Computer Networks (A+), Modern Operating System (A), Principles of Assembly and Compilation (A+), Principles of Database Systems (A+), Introduction to Artificial Intelligence (A)

PUBLICATION

- He Wang*, **Yezhen Cong***, Or Litany, Yue Gao and Leonidas J. Guibas. 3DIoUMatch: Leveraging IoU Prediction for Semi-Supervised 3D Object Detection. Submitted to *2021 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. Under review. [link]

RESEARCH EXPERIENCE AND PROJECTS

Stanford University, Computer Science Department Apr. 2020 – Nov. 2020

Research Assistant to Prof. Leonidas J. Guibas, ACM fellow, IEEE fellow

3DIoUMatch: Leveraging IoU Prediction for Semi-Supervised 3D Object Detection

- Proposed a novel semi-supervised method for 3D object detection based on pseudo-label propagation along with a carefully designed filtering mechanism; This method outperformed the prior art significantly under all settings on the two major indoor object detection benchmarks, ScanNet and SUNRGB-D
- Proposed leveraging predicted 3D IoU as localization confidence for pseudo-label filtering for the first time in both 2D and 3D semi-supervised object detection to improve the localization quality of pseudo-labels
- Devised a differentiable 3D IoU module that enabled our localization filtering, IoU-guided NMS and IoU optimization for bounding box refinement, and predicted IoU more accurately than previous designs
- Submitted a paper to CVPR 2021 as joint first author, currently under review

Tsinghua University, School of Software Apr. 2019 – Nov. 2019

Research Assistant to Assoc. Prof. Yue Gao

PointAlign: Towards Rotation Invariant Point Cloud Representation via Tangent Space Alignment

- Proposed a method of hierarchically aligning point cloud to local tangent space, which could be easily applied to multiple mainstream point cloud networks and make them invariant to arbitrary rotation.
- With our add-on method, RS-CNN could reach 90.8% classification accuracy under random SO(3) rotation compared to 31.4% without our method on ModelNet40, outperforming the prior art remarkably
- Participated in Academic Promotion Program at Tsinghua University and awarded Outstanding Oral Presentation. Submitted a paper to CVPR 2020 as joint first author

Tsinghua University, School of Software Nov. 2018 – Feb. 2019

Research Assistant to Assoc. Prof. Yue Gao

Visual Object Recognition

- Studied how to learn joint representation of multimodal data for object recognition; Designed and implemented several methods of fusing point cloud data and multi-view image data
- Won the First Prize in Scientific Research Training Program of School of Software, Tsinghua University

WeChat Mini-Program Development Competition 2020 [link] May. 2020 – Aug. 2020

Supervised by Assoc. Prof. Qiang Liu

- Designed a creative, playable and user-friendly WeChat Mini-Game called Yin-Yang with a classmate
- Implemented the game in JavaScript using Cocos Engine; Created the art resources ourselves with online resources and Photoshop; Improved the smoothness and speed of the game by using techniques such as resource preloading and node pool recycling
- Won the First Prize (4/171); Contacted by a game company for possible cooperation

Kaggle Open Images 2019 – Visual Relationship [link] Aug. 2019 – Oct. 2019

Supervised by Assoc. Prof. Yue Gao

- To provide high quality bounding boxes for detecting visual relationship, surveyed and compared many state-of-the-art 2D detectors; Preprocessed the raw data for training the detectors
- Inspired by several key improvements in SOTA detection methods, refined my own detection network based on YOLOv3 and obtained higher-quality bounding boxes, which improved the visual relationship detection performance, helping our team win Silver Medal

Work Experience

SenseTime Mar. 2020 – May. 2020, Oct. 2020 – Present

Research Intern, Department of Deep Learning Platform and Tools

Supervised by Vice Director Kai Chen

- Studied single-stage instance segmentation; Implemented several improvements of PolarMask (a single-stage instance segmentation work) including semantic fusion, corner pooling and iterative contour point regression using PyTorch based on SenseTime's MMDetection
- Participated in the development of MMDetection3D, a 3D object detection platform maintained by SenseTime (GitHub 660+ stars); Contributed to the platform by implementing new features (i.e. IoU loss) and new datasets (i.e. SUNRGB-D with image data), as well as reproducing new methods such as ImVoteNet (Code unreleased)

Selected Awards and Honors (in chronological order)

- **First Prize** in WeChat Mini-Program Development Competition 2020, Mini-Game Track (4/171 teams from universities all over China) 2020
- **National Scholarship** for 2019~2020 (Top 1% at Tsinghua University) 2020
- **National Scholarship** for 2018~2019 (Top 1% at Tsinghua University) 2019
- **SenseTime Scholarship** 2019 (29 recipients selected from all Chinese undergraduates) 2019
- **Undergraduate Student Travel Award** of MICCAI 2019 (45 recipients worldwide) 2019
- **Silver Medal** in Open Images 2019, Visual Relationship Track (Top 10% among 200+ teams) 2019
- **Outstanding Oral Presentation Award** in Academic Promotion Program of Tsinghua University 2019
- **First Prize** in Scientific Research Training Program of School of Software, Tsinghua University 2018
- **"12-9" Scholarship** for 2017~2018 (Top 1% at Tsinghua University) 2018

Skills

Programming Skills

Fluent: Python, C/C++, JavaScript, PyTorch

Intermediate: Java, MATLAB, Assembly, LaTeX, TensorFlow, OpenCV

Language Skills

Chinese: Mother tongue

English: Fluent, TOEFL (iBT) score 115 (R30, L30, S27, W28), GRE 339 (V169, Q170) +AW4.5

Leadership

Extensive leadership experience — Vice President of Student Union at School of Software at Tsinghua University, Class Monitor, Social Practice Team Leader