

TETE XIAO

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EDUCATION

Peking University, Beijing, China

(2015.9 - present)

B.S., Department of Intelligence Science, School of Electronics Engineering and Computer Science

GPA: 3.71 / 4

Core Courses: Advanced Mathematics (94 & 100), Linear Algebra (91), Introduction to Computing (93), Practice of Programming in C&C++ (100), Data Structure and Algorithms (91)

PUBLICATIONS

1. ***Tete Xiao**, *Yingcheng Liu, Yuning Jiang, Bolei Zhou and Jian Sun (*: equal contribution)
Unified Perceptual Parsing for Scene Understanding,
Submitted to European Conference on Computer Vision (ECCV) 2018.
2. *Haoyue Shi, ***Tete Xiao**, Jiayuan Mao, Yuning Jiang, and Jian Sun (*: equal contribution)
Learning Visually-grounded Word Semantics from Adversarial Samples,
Submitted to International Conference on Computational Linguistics (COLING) 2018.
3. *Ruixuan Luo, *Borui Jiang, **Tete Xiao**, Yuning Jiang, Shuai Shao and Jian Sun
Is Higher Always Better? Towards Accurate Object Localization via IoU Prediction Loss,
Submitted to European Conference on Computer Vision (ECCV) 2018.
4. *Chao Peng, ***Tete Xiao**, *Zeming Li, Yuning Jiang, Xiangyu Zhang, Kai Jia, Gang Yu and Jian Sun (*: equal contribution)
MegDet: A Large Batch Object Detector (To Appear),
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), (**Spotlight**), June 2018.
Winner of the COCO 2017 Detection Challenge.
5. Xinlong Wang, **Tete Xiao**, Yuning Jiang, Shuai Shao, Jian Sun and Chunhua Shen
Repulsion Loss: Detecting Pedestrians in a Crowd (To Appear),
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), June 2018.
6. *Jiayuan Mao, ***Tete Xiao**, Yuning Jiang and Zhimin Cao (*: equal contribution)
What Can Help Pedestrian Detection,
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), July 2017.

ACADEMIC COMPETITIONS

1. *Chao Peng, ***Tete Xiao**, *Zeming Li, Yuning Jiang, Xiangyu Zhang, Kai Jia, Gang Yu and Jian Sun (*: indicates equal contribution)
Megvii (Face++),
Winner of the COCO 2017 Detection Challenge.
2. ***Tete Xiao**, *Ruixuan Luo, *Borui Jiang, Shuai Shao, Yuning Jiang, Yadong Mu, Jieqi Shi, Chi Zhang and Jian Sun (*: indicates equal contribution)
Megvii (Face++) and Peking University,
Winner of the Places 2017 Instance Segmentation Challenge.
3. Yilun Chen*, Zhicheng Wang*, Yuxiang Peng, Zhiqiang Zhang, Gang Yu, Chao Peng, **Tete Xiao**, Zeming Li, Yuning Jiang, Xiangyu Zhang, Jian Sun (*: indicates equal contribution)
Megvii (Face++),
Winner of the COCO 2017 Human Keypoint Challenge.
4. Ruixuan Luo*, Borui Jiang*, **Tete Xiao***, Chao Peng*, Yuning Jiang, Zeming Li, Xiangyu Zhang, Gang Yu and Jian Sun (*: indicates equal contribution)
Megvii (Face++) and Peking University,
First runner-up of the COCO 2017 Instance Segmentation Challenge.

EXPERIENCE & PROJECTS

Senior Research Intern in Computer Vision

(2015.12 - present)

Mentor: Mr. Yuning Jiang, Lead Researcher, Megvii (Face++) Research

Supervisor: Dr. Jian Sun, Chief Scientist, Megvii (Face++) Research

Project I: *Visual Concept Discovery and Scene Understanding (joint work with MIT)* (2017.11 -)

- Motivated by the fact that, at a single glance, human visual system is able to extract a remarkable amount of semantic information from a scene, we propose a new parsing task called Unified Perceptual Parsing (UPP), which requires a single framework to solve several visual recognition tasks, namely, segmentation of texture, material, object part and object and classification of scene, all at once.
- We also propose a framework that allows us to overcome the heterogeneity of different datasets, since there is no single dataset that has all annotations.
- We further apply the trained model to discover the visual knowledge underlying scene understanding.

Project II: *Vision and Language: Visually-grounded Word Embedding* (2017.11 -)

- A baby can be crying, or smiling. But pure linguistic analysis cannot discover the difference between “cry” and “smile”. Thus we propose a novel method to train word embeddings on visual tasks, such as image-text retrieval, to align a word with a real concept in the visual world.
- We discuss the robustness of current image-text retrieval framework, and find that they do not successfully learn the alignment between word and visual concept. On the contrary, we use adversarial samples to force the model to distinguish similar concepts. In this way, the model is able to learn meaningful alignment in a weakly-supervised way.

Project III: *General Object Detection: The Misunderstanding of Objectness Score* (2017.11 -)

- There has been a long history of research on object detection that uses the objectness scores to rank the possible regions of objects. However, these “objectness” scores are also used to measure the accuracy of localization. Statistics show this is not true, because proposals with higher objectness score do not necessarily mean they have better localizations.
- We modify the framework by adding a simple IoU prediction loss, which enables the network to predict the real overlaps between a proposal and a ground-truth. We demonstrate the effectiveness of the proposed method. Moreover, the predicted IoU is further applied to improve NMS algorithm.

Project IV: *General Object Detection and Instance Segmentation: COCO Competition (2017.4 - 2017.10)*

- Proposed a warm-up policy and cross-GPU batch normalization algorithm which enable us to train a large batch object detector by Megvii (Face++)’s large-scale deep learning framework using up to 128 GPUs in parallel.
- For detection, the framework was designed following Feature Pyramid Network. Sophisticated context modules and instance-blind segmentation supervision were also applied.
- For instance segmentation, proposed the Precise RoI Pooling and the Inverse RoI Pooling to accurately sample feature points and map sampling points to feature points. Context modules were also used.
- The two framework won the champions of COCO 2017 Detection Challenge and Places 2017 Instance Segmentation Challenge, and the runner-up of COCO 2017 Instance Segmentation Challenge.

Project V: *Pedestrian Detection: Detecting Pedestrians in a Crowd* (2017.7 - 2017.11)

- Explored how pedestrian detectors are harmed by crowd occlusion. Moreover, proposed a novel loss function, which was able to prevent predicted boxes from shifting to its neighboring objects in crowd scenes.
- Achieved state-of-the-art performance on several challenging datasets and benchmarks. It was also useful for general object detection.
- Paper “Repulsion Loss: Detecting Pedestrians in a Crowd” was submitted to CVPR 2018.

Project VI: *Pedestrian Detection: A Transfer Learning Approach* (2016.6 - 2016.11)

- Explored how aggregating extra features can help CNN-based pedestrian detection framework and proposed a novel network architecture, which was able to utilize the information of given features and improve detection performance without extra inputs in inference.
- Paper “What Can Help Pedestrian Detection” was accepted to CVPR2017.

Research Assistant in Computer Vision

(2016.5 - present)

Supervisor: Dr. Yadong Mu, Machine Intelligence Lab, Institute of Computer Science and Technology, Peking University

Project I: Instance Segmentation (jointly work with Megvii Research)

(2017.4 - 2017.10)

- See above.

Project II: Traffic Light Detection for Autonomous Car

(2016.11 - 2016.12)

- Implemented a Faster-RCNN detector for small objects. Used context cropping, dilated convolution and scale jittering to boost performance for small objects.
- The framework won the second award at CCF Big Data Challenge 2016.

COMPETITIONS

1. Gold Medals, ACM International Collegiate Programming Contest (ACM-ICPC) Asia Regional, 2016.11 & 2017.11
2. Gold Medal, “Surpass Cup” Peking University Programming Contest, 2016.5
3. Bronze Medal, National Olympiad in Informatics, 2014.8
4. Champion, Shandong Province Team Selection Contest, 2014.5

HONORS & AWARDS

1. China National Scholarship, Peking University, 2015 - 2016
2. The Scholarship for the Outstanding Talented, Peking University, 2017.6
3. Merit Student, Peking University, 2015 - 2016

LEADERSHIP & ACTIVITIES

1. Assistant Coach of Team PKU at ACM/ICPC World Final 2017, Rapid City, U.S., where we ranked **7** worldwide and won a **silver medal**, the second best record of the university.