Wenhai Wang

Email: wangwenhai362@{163.com, smail.nju.edu.cn}

Homepage: https://whai362.github.io

Education

Nanjing University, Nanjing, China — Sep. 2016 - Sep. 2021

Ph.D. in Computer Science and Technology, *Supervised by Prof. Tong Lu*.

Nanjing University of Science and Technology, Nanjing, China — Sep. 2012 - Jun. 2016

B.E. in Software Engineering.

Research Interests

- CNN / Transformer Backbone Design [6, 11, 2]
- Object Detection / Instance and Semantic Segmentation [7, 10, 9, 15, 12, 8]
- Optical Character Recognition [1, 4, 5, 3, 17]

Experience

Github: https://github.com/whai362

Shanghai Artificial Intelligence Laboratory, Shanghai, China — Sep. 2021 - Present

Young Scientist, *Supervised by Dr. Jifeng Dai and Prof. Yu Qiao*

- **Vision-Language Model**. Aims to design vision language models for long-tail distribution image recognition.
- **Vision Transformer**. Aims to design effective and efficient vision transformer encoder / decoder for image recognition tasks, such as classification, detection and segmentation.

The University of Hong Kong, Hongkong, China — Oct. 2019 - Mar. 2020

Research Assistant, *Supervised by Prof. Ping Luo*

- **One-stage Instance Segmentation**. Proposed an anchor-box free and single shot instance segmentation method, termed PolarMask, which formulates the instance segmentation problem as instance center classification and dense distance regression in a polar coordinate. This work *PolarMask: Single Shot Instance Segmentation with Polar Representation* is accepted by CVPR 2020, and the extension version is accepted by TPAMI 2021.

SenseTime, Beijing, China — Aug. 2019 - Mar. 2020

Research Intern, *Supervised by Xuebo Liu and Ding Liang*

- **Optical Character Recognition**. Did research on text detection and recognition in natural scenes, and tried to 1) solve the ambiguity in text detection and 2) design a real-time algorithm for arbitrary-shaped text detection and recognition. The first work is accepted by ECCV 2020, and the second work is accepted by TPAMI 2021.

Momenta, Beijing, China — Jun. 2018 - Dec. 2018

Research Intern, *Supervised by Dr. Xiang Li*

- **Deep Neural Networks Exploration**. Did research on the receptive fields of CNNs, and designed a dynamic selection mechanism in CNNs that allows each neuron to adaptively adjust its receptive field. This work *Selective Kernel Networks* is accepted by CVPR 2019.
- **Object Detection**. Led a team to take part in Autonomous Driving Perception Task in AI Challenger 2018. Re-implemented and improved Cascade R-CNN to detect objections in autonomous driving scenarios. Our team finally secured the 2nd place in the task.

Contests

- National Artificial Intelligence Challenge (NAIC) 2020 , Remote Sensing Semantic Segmentation Task, **1st Place, 1,000,000 RMB** Nov. 2020
- ICDAR2019 Robust Reading Challenge on Arbitrary-Shaped Text, Task1, **1st Place** May 2019
- ICDAR2019 Robust Reading Challenge on Large-scale Street View Text with Partial Labeling, Task1, **2nd Place** Jun. 2019
- AI Challenger 2018 Autonomous Driving Perception Task, **2nd Place, 40,000 RMB** Dec. 2018
- ACM-ICPC Asia Regional Contest, **Silver Medal** Nov. 2015

Honors and Awards

- National Scholarship (top 1%) Oct. 2019

Publications

Google Scholar: `https://scholar.google.com/citations?user=WM0OglcAAAAJ`

Top-Tier Computer Vision Journal/Conference Papers

[1] **W. Wang**, E. Xie, X. Li, et al. *PAN++: Towards Efficient and Accurate End-to-End Spotting of Arbitrarily-Shaped Text*, in IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021.

[2] **W. Wang**, E. Xie, X. Li, et al. *Pyramid Vision Transformer: A Versatile Backbone for Dense Prediction without Convolutions*, in IEEE International Conference on Computer Vision (ICCV), Virtual, 2021. (Oral)

[3] **W. Wang**, X. Liu, X. Ji, et al. *AE TextSpotter: Learning Visual and Linguistic Representation for Ambiguous Text Spotting*, in the European Conference on Computer Vision (ECCV), Online, 2020.

[4] **W. Wang**, E. Xie, X. Li, et al. *Shape Robust Text Detection with Progressive Scale Expansion Network*. in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Long Beach, CA, USA, 2019.

[5] **W. Wang**, E. Xie, X. Song, et al. *Efficient and Accurate Arbitrary-Shaped Text Detection with Pixel Aggregation Network*, in IEEE International Conference on Computer Vision (ICCV), Seoul, Korea, 2019.

[6] **W. Wang**, X. Li, T. Lu, et al. *Mixed Link Networks*, in International Joint Conference on Artificial Intelligence (IJCAI), Stockholm, Sweden, 2018.

[7] E. Xie, **W. Wang**, M. Ding, et al. *PolarMask++: Enhanced Polar Representation for Single-Shot Instance Segmentation and Beyond*, in IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021.

[8] E. Xie, **W. Wang**, Z. Yu, et al. *SegFormer: Simple and Efficient Design for Semantic Segmentation with Transformers*, in Advances in Neural Information Processing Systems (NeurIPS), 2021.

[9] X. Li, **W. Wang**, X. Hu, et al. *Generalized Focal Loss V2: Learning Reliable Localization Quality Estimation for Dense Object Detection*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Virtual, 2021.

[10] X. Li, **W. Wang**, L. Wu, et al. *Generalized Focal Loss: Learning Qualified and Distributed Bounding Boxes for Dense Object Detection*, in Advances in Neural Information Processing Systems (NeurIPS), 2020.

[11] X. Li, **W. Wang**, X. Hu, et al. *Selective Kernel Networks*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Long Beach, CA, USA, 2019.

[12] E. Xie, J. Ding, **W. Wang**, et al. *Detco: Unsupervised contrastive learning for object detection*, in IEEE International Conference on Computer Vision (ICCV), Virtual, 2021.

[13] E. Xie, W. Wang, **W. Wang**, et al. *Segmenting Transparent Objects in the Wild*, in the European Conference on Computer Vision (ECCV), Online, 2020.

[14] E. Xie, W. Wang, **W. Wang**, et al. *Segmenting Transparent Object in the Wild with Transformer*, in International Joint Conference on Artificial Intelligence (IJCAI), Montreal, Canada, 2021.

[15] E. Xie, P. Sun, X. Song, **W. Wang**, et al. *PolarMask: Single Shot Instance Segmentation with Polar Representation*, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Seattle, Washington, USA, 2020. (Oral)

[16] S. Jin, W. Liu, E Xie, **W. Wang**, et al. *Differentiable Hierarchical Graph Grouping for Multi-Person Pose Estimation*, in the European Conference on Computer Vision (ECCV), Online, 2020.

[17] W. Wang, E. Xie, X. Liu, **W. Wang**, et al. *Scene Text Image Super-Resolution in the Wild*, in the European Conference on Computer Vision (ECCV), Online, 2020.

Academic Service

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Image Processing (TIP)
- IEEE Transactions on Multimedia (TMM)
- Computational Visual Media Journal (CVM)

(Senior) Program Committee Member/Conference Reviewer

- IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020, 2021, 2022
- Neural Information Processing Systems (NeurIPS), 2020, 2021
- International Conference on Machine Learning (ICML), 2021
- International Conference on Learning Representations (ICLR), 2021
- IEEE International Conference on Computer Vision (ICCV), 2021
- International Joint Conference on Artificial Intelligence (IJCAI), 2021, 2022
- Asian Conference on Computer Vision 2020 (ACCV), 2020
- IEEE Winter Conference on Applications of Computer Vision (WACV), 2021