

# WENHAI WANG

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**Homepage:** <https://whai362.github.io>

## EDUCATION

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- 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

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- CNN / Transformer Backbone [6, 12, 2]
- Object Detection & Semantic/Instance/Panoptic Segmentation [8, 11, 10, 16, 13, 9]
- Scene Text Detection & Recognition [1, 4, 5, 3, 18]

## EXPERIENCE

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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 2<sup>nd</sup> place in the task.

## CONTESTS

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

## HONORS AND AWARDS

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- National Scholarship (top 1%) Oct. 2019

## PUBLICATIONS

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Google Scholar: <https://scholar.google.com/citations?user=WM00g1cAAAAJ>

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[J]. 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[C] // Proceedings of IEEE International Conference on Computer Vision (ICCV). 2021. (Oral)
- [3] **W. Wang**, X. Liu, X. Ji, et al. AE TextSpotter: Learning Visual and Linguistic Representation for Ambiguous Text Spotting[C] // Proceedings of the European Conference on Computer Vision (ECCV). 2020.
- [4] **W. Wang**, E. Xie, X. Li, et al. Shape Robust Text Detection with Progressive Scale Expansion Network[C] // Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR). 2019.
- [5] **W. Wang**, E. Xie, X. Song, et al. Efficient and Accurate Arbitrary-Shaped Text Detection with Pixel Aggregation Network[C] // Proceedings of IEEE International Conference on Computer Vision (ICCV). 2019.
- [6] **W. Wang**, X. Li, T. Lu, et al. Mixed Link Networks[C] // Proceedings of International Joint Conference on Artificial Intelligence (IJCAI). 2018. (Oral)
- [7] Z. Chen, **W. Wang**, E. Xie, et al. Towards Ultra-Resolution Neural Style Transfer via Thumbnail Instance Normalization[C] // Proceedings of the Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI). 2022.
- [8] E. Xie, **W. Wang**, M. Ding, et al. PolarMask++: Enhanced Polar Representation for Single-Shot Instance Segmentation and Beyond[J]. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI). 2021.
- [9] E. Xie, **W. Wang**, Z. Yu, et al. SegFormer: Simple and Efficient Design for Semantic Segmentation with Transformers[C] // Advances in Neural Information Processing Systems (NeurIPS). 2021.
- [10] X. Li, **W. Wang**, X. Hu, et al. Generalized Focal Loss V2: Learning Reliable Localization Quality Estimation for Dense Object Detection[C] // Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR). 2021.
- [11] X. Li, **W. Wang**, L. Wu, et al. Generalized Focal Loss: Learning Qualified and Distributed Bounding Boxes for Dense Object Detection[C] // Advances in Neural Information Processing Systems (NeurIPS). 2020.
- [12] X. Li, **W. Wang**, X. Hu, et al. Selective Kernel Networks[C] // IEEE Conference on Computer Vision and Pattern Recognition (CVPR). 2019.
- [13] E. Xie, J. Ding, **W. Wang**, et al. Detco: Unsupervised contrastive learning for object detection[C] // Proceedings of IEEE International Conference on Computer Vision (ICCV). 2021.
- [14] E. Xie, W. Wang, **W. Wang**, et al. Segmenting Transparent Objects in the Wild[C] // Proceedings of the European Conference on Computer Vision (ECCV). 2020.
- [15] E. Xie, W. Wang, **W. Wang**, et al. Segmenting Transparent Object in the Wild with Transformer[C] // Proceedings of International Joint Conference on Artificial Intelligence (IJCAI). 2021.

- [16] E. Xie, P. Sun, X. Song, **W. Wang**, et al. PolarMask: Single Shot Instance Segmentation with Polar Representation[C] // Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR). 2020. (Oral)
- [17] S. Jin, W. Liu, E Xie, **W. Wang**, et al. Differentiable Hierarchical Graph Grouping for Multi-Person Pose Estimation[C] // Proceedings of the European Conference on Computer Vision (ECCV). 2020.
- [18] W. Wang, E. Xie, X. Liu, **W. Wang**, et al. Scene Text Image Super-Resolution in the Wild[C] // Proceedings of the European Conference on Computer Vision (ECCV). 2020.

## ACADEMIC SERVICE

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### 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