QI BI

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EDUCATION

University of Amsterdam, The Netherlands *September 2020 - September 2024 (Expected)*
PhD. candidate in Computer Vision
Supervised by Dr. Shaodi You and Prof. Theo Gevers
Working on Vision in Bad Weather, Semantic Segmentation and Domain Generalization
Student Member of IEEE
Graduate Courses: Computer Vision by Learning, Efficient Deep Learning, Distributed Systems, Hardware & System Security

Wuhan University, China *September 2017 - June 2020*
MSc. in Information Engineering
Advised by Prof. Kun Qin and Prof. Gui-Song Xia
Student Member of IEEE
Graduate Courses: Image Interpretation & Pattern Recognition, Model Recognition & Machine Learning, Matrix Theory, Machine Vision & Photogrammetry
Average Score: 92.2 /100, GPA: 3.7 /4.0

Wuhan University, China *September 2013 - June 2017*
B.E. in Information Engineering
Advised by Prof. Kun Qin
Undergraduate Courses: Digital Image Processing, Pattern Recognition, Computer Graphics, Data Structure, Object-Oriented Programming & Design, Advanced Mathematics, Linear Algebra, Probability Theory and Statistics, Computational Method
Average Score: 85.2 /100, GPA: 3.5 /4.0

RESEARCH EXPERIENCE

University of Amsterdam September 2020 - Present
Researcher, funded by University of Amsterdam *Amsterdam, The Netherlands*

- Developed a Bi-directional Wavelet Guidance (BWG) Mechanism for domain generalized foggy-scene semantic segmentation; **the first pipeline** to generalize to arbitrary unseen foggy domains from a single clear source domain.
- Developed a Content-enhanced Mask Attention mechanism and a Content-enhanced Mask Transformer (CMFormer) for domain generalized urban-scene semantic segmentation.
- Developed a multi-weather uncertainty learning pipeline based on physical weather formulation; proposed **the first dataset** for multi-weather probability estimation (MePe).
- Developed an intrinsic-extrinsic interactive learning pipeline for robust scene segmentation under all-day scenarios; proposed **the first dataset** for all-day semantic segmentation.
- Developed a rotation-invariant scene representation learning method based on deep multiple instance learning; The proposed method is robust to the domains of natural images, medical images and remote sensing images.

Youtu Lab, Tencent Holdings Ltd. April 2020 - September 2020
Research Intern, funded by Jarvis Research Center *Shenzhen, China*

- Led by Dr. Yefeng Zhen *IEEE Fellow*, mentored by Dr. Shuang Yu, Dr. Yuexiang Li & Dr. Hao Zheng
- Developed a domain generalized medical image segmentation method by querying from decoupled features; **the first pipeline** to leverage Vision Transformer for domain generalized medical image segmentation.

- Developed an automatic retinal disease diagnosis pipeline by deep multiple instance learning.
- Co-developed a medical image segmentation method from multiple annotations by multi-rater agreement modeling.

Wuhan University September 2017 - June 2020
Research Assistant, funded by Wuhan University *Wuhan, China*

- Developed a discriminative aerial scene representation learning method by modeling context-aware class peak response.
- Developed a multi-grain deep multiple instance learning framework, dubbed as AGOS, which maintains the same semantic scheme for each grain.
- Developed a multiple instance CNN named MIDC-Net and a trainable MIL pooling operator based on deep multiple instance learning and attention mechanism.
- Developed a computational-efficient feature extractor differential filter profile (DFP) and extended it into multi-channels.
- Published an annotated dataset named WHUBED for aerial image building segmentation.

Wuhan University May 2015 - May 2016
Project Leader, funded by Wuhan University *Wuhan, China*

- Developed the scale-invariant feature transformation (SIFT) image matching algorithm for 3D object reconstruction.
- Co-developed of an Android application reconstructing objects from multiple images taken by phone camera.

HONORS AND AWARDS

Outstanding Reviewer for CVPR 2023	top 3.3%, 232/7403
CVPR 1st workshop on Vision-based InduStrial InspectiON Best Paper Award	2023
CVPR 2021 Best Paper Candidate	top 0.46%, 32/7015
MICCAI Travel Awards	2021
MICCAI Young Scientist Awards Candidate	2021
National Excellent Graduate Students	2019
Wuhan University Scholarship for Excellent Graduate Students	2017, 2018, 2019
Wuhan University Merit Graduate Students	2018
Wuhan University Excellent Bachelor Academic Dissertation	rank 1/246
Wuhan University Excellent Undergraduate Scholarship	2015, 2016

PROFESSIONAL ACTIVITIES

Reviewer for T-PAMI, IJCV, T-IP	2021 - Present
Reviewer for CVPR, ICCV, ECCV	2022 - Present
Reviewer for NeurIPS, ICML, ICLR	2023 - Present
Reviewer for AAAI, IJCAI, EMNLP	2023 - Present
Reviewer for MICCAI, ICASSP	2021 - Present
Reviewer for WACV, BMVC, ACCV	2023 - Present
IEEE Student Member	2019 - Present
AAAI Member	2023 - Present

PEER-REVIEWED PUBLICATION

The full publication can be found in Google Scholar. Some representative publications are listed below.

Qi Bi, Shaodi You, Theo Gevers. Learning Generalized Segmentation for Foggy-Scenes by Bi-directional Wavelet Guidance. Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2024

Qi Bi, Shaodi You, Theo Gevers. Learning Content-Enhanced Mask Transformer for Domain Generalized Urban-scene Segmentation. Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2024

Qi Bi, Shaodi You, Theo Gevers. Interactive Learning of Intrinsic and Extrinsic Properties for All-day Semantic Segmentation. IEEE Transactions on Image Processing (T-IP), 2023

Qi Bi, Jingjun Yi, Hao Zheng, Wei Ji, Yawen Huang, Yuexiang Li, Yefeng Zheng. Learning Generalized Medical Image Segmentation from Decoupled Feature Queries. Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2024

Wei Ji, Jingjing Li, **Qi Bi**, Chuan Guo, Jie Liu, Li Cheng. Promoting Saliency From Depth: Deep Unsupervised RGB-D Saliency Detection. International Conference on Learning Representations (ICLR), 2022

Junwen Pan*, **Qi Bi***, Yanzhan Yang, Pengfei Zhu, Cheng Bian. Label-efficient Hybrid-supervised Learning for Medical Image Segmentation. Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2022 (*: equal contribution)

Qi Bi, Kun Qin, Han Zhang, Gui-Song Xia. Local semantic enhanced convnet for aerial scene recognition. IEEE Transactions on Image Processing (T-IP), 2021

Jingjing Li, Wei Ji, **Qi Bi**, Cheng Yan, Miao Zhang, Yongri Piao, Huchuan Lu. Joint semantic mining for weakly supervised RGB-D salient object detection. Advances in Neural Information Processing Systems (NeurIPS), 2021

Qi Bi, Shuang Yu, Wei Ji, Cheng Bian, Lijun Gong, Hanruo Liu, Kai Ma, Yefeng Zheng. Local-global dual perception based deep multiple instance learning for retinal disease classification. Medical Image Computing and Computer Assisted Intervention (MICCAI), 2021

Wei Ji, Shuang Yu, Junde Wu, Kai Ma, Cheng Bian, **Qi Bi**, Jingjing Li, Hanruo Liu, Li Cheng, Yefeng Zheng. Learning calibrated medical image segmentation via multi-rater agreement modeling. Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021

Qi Bi, Kun Qin, Zhili Li, Han Zhang, Kai Xu, Gui-Song Xia. A multiple-instance densely-connected ConvNet for aerial scene classification. IEEE Transactions on Image Processing (T-IP), 2020

SUPERVISION

Noud Corten	November 2021-August 2022 (UvA MSc., Supervisor, Completed)
Carlo Airaghi	April 2021-December 2021 (UvA MSc., Supervisor, Completed)
Silvan Murre	March 2021-June 2021 (UvA MSc., Supervisor, Completed)
Lin Qi	September 2021-June 2023 (WHU MEng., Co-supervisor, Completed)
Han Zhang	September 2018-June 2021 (WHU MSc., Co-supervisor, Completed)

TEACHING

2024 Computer Vision 2	UvA, Teaching Assistant
2023 Computer Vision 1	UvA, Teaching Assistant
2023 Computer Vision 2	UvA, Teaching Assistant
2022 Computer Vision 1	UvA, Teaching Assistant
2021 Computer Vision 1	UvA, Teaching Assistant
2020 Computer Vision 1	UvA, Teaching Assistant

SKILLS

Languages	TOEFL:106 (Listening: 28, Reading: 29, Speaking: 23, Writing: 26)
Program Skills	Proficient in Python (6yrs) and Matlab (10yrs), familiar with C/C++ (9.5yrs)
Deep Learning Framework	PyTorch (3.5yrs), TensorFlow (6yrs), Keras (5.5yrs)