

# QI BI

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University of Amsterdam ◇ 1098 XH, Amsterdam, The Netherlands  
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## EDUCATION

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### 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

Doctoral Thesis: *Robust Vision in Adverse Conditions* (tentative)

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

Master Thesis: *Enhancing Local Semantic Representation for Remote Sensing Scene Classification*

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

Bachelor Thesis: *Building Detection and Change Analysis from Time-Series Remote Sensing Images*

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

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### 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

- 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**

December 2019 - September 2020

*Research Assistant, funded by General Administration of Civil Aviation of China (No. U2033216)*      *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.

#### **Wuhan University**

October 2016 - October 2019

*Research Assistant, funded by Key Research & Development Program of China (No. 2016YFB0502600)*      *Wuhan, China*

- Developed a multiple instance CNN named MIDC-Net and a trainable MIL pooling operator based on deep multiple instance learning and attention mechanism.
- Developed an attention pooling operator and a ConvNet named APDC-Net for aerial image scene classification.
- 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**

June 2017 - June 2019

*Research Assistant, funded by State Grid of China (No. JYYKJXM(2017)011)*      *Wuhan, China*

- Developed a harbor detection framework for aerial images based on multiple visual descriptors and feature encoding.
- Developed a feature encoding approach based on bag of visual words and probabilistic latent semantic analysis.
- Implemented geometric correction and illumination correction for aerial images.

#### **Wuhan University**

May 2015 - May 2016

*Project Leader, funded by Wuhan University (No. S2015714)*      *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**

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|--|--------------------|
| 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**

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|----------------------------------|----------------|
| 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  
IEEE Student Member  
AAAI Student Member

2023 - Present  
2019 - Present  
2023 - Present

## PEER-REVIEWED PUBLICATION

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The research focuses on learning discriminative, robust and generalizable visual representations for multiple scenarios such as autonomous driving, medical imaging and aerial imaging. By Jan. 2024, about 30 peer-reviewed journal and conference papers have been published, with a citation of 1034, h-index of 17 and i10-index of 18. 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

**Qi Bi**, Beichen Zhou, Kun Qin, Qinghao Ye, Gui-Song Xia. All Grains, One Scheme (AGOS): Learning Multi-grain Instance Representation for Aerial Scene Classification. IEEE Transactions on Geoscience and Remote Sensing (T-GRS), 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

**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

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

## SUPERVISION

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**Noud Corten** November 2021-August 2022 (UvA, Supervisor, Completed)  
*Improved Road Crack Severity Measurement Using Deep Convolutional Networks by Storing Spatial Information*

**Carlo Airaghi** April 2021-December 2021 (UvA, Supervisor, Completed)  
*Multi-Stage Multiscale Training Architecture for Semantic Segmentation of Remote Sensing Images*

**Silvan Murre** March 2021-June 2021 (UvA, Supervisor, Completed)  
*Layout2Land: Semi-Supervised Learning of a Layout and Style Reconfigurable GAN*

BeiChen Zhou

Lin Qi

Change Detection in Airport Clearance Area by Deep Learning

Han Zhang

September 2022-Present (WHU, Co-supervisor, with Prof. Gui-Song Xia)

September 2021-June 2023 (WHU, Co-supervisor, Completed)

September 2018-June 2021 (WHU, Co-supervisor, Completed)

Detection and Recognition of New Buildings in Airport Clearance Area based on High Resolution Images

TEACHING

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|------------------------|-------------------------|
| 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

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|-------------------------|--|
| 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)                          |