**A person in a black shirt

Description automatically generatedBenyun ZHAO (赵犇赟)**

Contact: (852) 67535779 | [byzhao@mae.cuhk.edu.hk](mailto:byzhao@mae.cuhk.edu.hk)

Wechat**(微信)**:Claude\_ZBY Date / Place of Birth: 1997.11 / Nanjing

Research Interests: Unmanned systems applications; Image processing,

3D scence understanding

**EDUCATION**

卡通人物

低可信度描述已自动生成 **The Chinese University of Hong Kong (香港中文大学)** 2022.09 - Present

**Ph.D. Candidate** **(博士候选人)**: *[USR Group](http://www.mae.cuhk.edu.hk/~usr/)*, *Mechanical and Automation Engineering*

**Supervisor**: [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/), Department Chairman, IEEE Fellow, Fellow of the Academy of Engineering Singapore, Provost’s Chair Professor of the National University of Singapore

**Coursework**: *Linear Systems Theory & Design (A/A), Micromachining & MEMS (A-/A), Design for Additive Manufacturing (A-/A), Advanced Robotics (B+/A)*

卡通人物

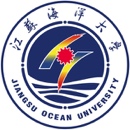
低可信度描述已自动生成 **The Chinese University of Hong Kong (香港中文大学)** 2020.09 - 2021.06

**Master of Science (理学硕士)**: [*USR Group*](http://www.mae.cuhk.edu.hk/~usr/), *Mechanical and Automation Engineering*

**Supervisor**: [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/), Department Chairman, IEEE Fellow, Fellow of the Academy of Engineering Singapore, Provost’s Chair Professor of the National University of Singapore

**GPA**: **3.675 / 4.000**

**Coursework**: *Control & Industrial Automation (A/A), Machine Learning for Singal Processing (A/A), Robotics (A-/A), MEMS Technology & Applications (A-/A), Computer Vision in Practice (B+/A)*, *MSc Project: Real-time Object Detector Implementation on UGV & UAV (A/A)*

 **Jiangsu Ocean Universiyt(江苏海洋大学)** 2016.09 - 2020.07

**Bachelor of Engineering(工学学士)**: *Mechanical Design, Manufacture and Automation*

**Supervisor**:*[Prof. Yiqiang He](https://jixie.jou.edu.cn/info/1212/1873.htm) and* [*Prof. Dazhi Huang*](https://mcme.jou.edu.cn/info/1361/2505.htm)

**GPA**: **4.53 / 5.00** **Ranking**: **3 / 204**

**Coursework**: *Advanced Mathematics (94 & 92/100), Geometric Drawing and Engineering Graphics (85/100),* *Linear Algebra (94/100),* *Probability and Statistics (91/100), Principles of Mechanics (88/100), Electrotechnics and Electronics (86/100), Solidworks 3D Model Design (95/100), Engineer Training (95 & 95 /100), Electrical Control of Machinery Tools and PLC (85/100), CAD & CAM (95/100), Insturial Robot (88/100), Professional English for Mechanical Engineering (96/100)*

**EXCHANGE & VISITING**

A logo of a university

Description automatically generated**Nanjing University of Science and Technology (南京理工大学)** 2024.05

**Visiting Student**, *Control Science and Engineering, School of Computer Science and Technology*

**Supervisor**: [*Prof. Zhenbo Song*](https://www.researchgate.net/profile/Song-Zhenbo) *and* [*Prof. Jianfeng Lu*](http://202.119.85.163/open/TutorInfo.aspx?dsbh=Xn3GKidYcoyr!Qa1YK4RAQ==&yxsh=4iVdgPyuKTE=&zydm=fY2NaWnaNpk=)

**University of California, Berkeley (加州大学伯克利分校)** 2023.09

**Visiting Student**, [*HiPeR Lab*](https://hiperlab.berkeley.edu/), *Mechanical Engineering*

**Supervisor**:[*Prof. Mark M. Mueller*](https://me.berkeley.edu/people/mark-w-mueller/)

**图片包含 旭日形

描述已自动生成Pengcheng Laboratory (鹏城国家实验室)** 2023.07

**International Symposium on Cooperative Autonomous Systems**

**Chairperson**: [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/), [*Prof. Jie Chen*](https://www.tongji.edu.cn/info/1136/21221.htm) *and* [*Prof. Hugh Liu*](https://www.flight.utias.utoronto.ca/fsc/index.php/team)

**Nanjing Tech University (南京工业大学)** 2018.08 - 2019.07

**Exchange Student**

**Coursework**: *Thermodynamics & Heat Transfer (85/100), Design of Mechanics (86/100), Numerical Computation (92/100), Principles of Microcontrollers (91/100), Fundamentals of Control Eningeering (85/100), Hydraulic and Pneumatic Transmission (89/100), Numerical Control Technology (88/100), Finite Element Analysis (94/100), Design and Manufacture of Pressing Model (95/100)*

**PUBLICATION**

**Journal Articles**:

[1] **B. Zhao**, X. Zhou, G. Yang, J. Wen, J. Zhang, J. Dou, G. Li, X. Chen and B. M. Chen, High-resolution infrastructure defect detection dataset sourced by unmanned systems and validated with deep learning approaches, *Automation in Construction (AIC)*, 2024.

[2] **B. Zhao**, Q. Duan, G. Yang, Z. Song, J. Wen, X. Liu, X. Chen and B. M. Chen, High-Performance Real-Time Defect Detector for UAV-Based Online Large-Scale Infrastructure Detection, *IEEE Transactions on Automation Science and Engineering (T-ASE, Under Review)*, 2024.

[3] **B. Zha****o1**, G. Yang1, J. Zhang, J. Wen, X. Chen and B. M. Chen, Det-Recon-Reg: An Intelligent Framework Towards Automated Large-Scale Infrastructure Inspection, *IEEE Transactions on Instrumentation and Measurement (T-IM, Under Review)*, 2024. (1 denotes co-first author)

[4] **B. Zhao1**, Q. Duan1, Z. Song, X. Zhang, X. Liu, X. Chen and B. M. Chen, VGS: Voxel Map based Surfel Gaussian Splatting for Scene Reconstruction, *IEEE Transactions on Industrial Electronics (T-IE, Under Review)*, 2024. (1 denotes co-first author)

[5] J. Zhang, **B. Zhao\***, G. Yang, X. Zhou, Y. Huang, C. Gao, X. Chen and B. M. Chen, Automated High-Precision Digital Twin Modeling of Building Façade Defects with Geobim-Assisted Registration, *Advanced Engineering Informatics (Revised and Resubmitted),* 2024. (\* denotes corresponding author)

[6] Q. Li, **B. Zhao\***, X. Wang, G. Yang, Y. Chang, X. Chen and B. M. Chen, Autonomous Building Material Stock Estimation using 3D Modeling and Multilayer Perceptron: A Case of Hong Kong, *Resources, Conservation & Recycling (Under Review)*, 2024 (\* denotes corresponding author)

[7] Q. Li, G. Yang, **B. Zhao**, X. Chen and B. M. Chen, Autonomous design framework for building integrated photovoltaics: data collection, 3D modeling, and deployment strategy, *Applied Energy*, 2024.

[8] G. Yang, J. Wen, **B. Zhao**, Q. Li, X. Chen and B. M. Chen,Towards End-to-End Underwater Multi-View Stereo for Real-World Dense Scene Reconstruction, *IEEE Transactions on Industrial Informatics (T-II, Revised and Resubmitted)*, 2024.

[9] P. Zhou, S. Li, **B. Zhao**, B. Wahlberg, X. Hu, Nature-inspired dynamic control for pursuit-evasion of robots, *Automatica (Under Review)*, 2024.

[10] J. Wen, G. Yang, **B. Zhao**, D. Huang, Y. Hu, B. Zhang, X. Chen and B. M. Chen, A semi-supervised domain-adaptive real-world underwater image enhancement method, *IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT, Under Review)*, 2024.

[11] G. Yang, K. Liu, J. Zhang, **B. Zhao**, Z. Zhao, X. Chen and B. M. Chen, Datasets and processing methods for boosting visual inspection of civil infrastructure: A comprehensive review and case study on crack classifications, segmentation, and detection, *Construction and Building Materials*, 2022.

[12] J. Wen, J. Cui, G. Yang, **B. Zhao**, Y. Zhai, Z. Gao, L. Dou and B. M. Chen, WaterFormer: Global-Local transformer for underwater image enhancement with environment adaptor, *IEEE Robotics and Automation Magazine (RA-M)*, 2024.

[13] G. Yang, R. Cao, J. Wen, **B. Zhao**, Q. Li, X. Chen, YH Liu and B. M. Chen, Multi-View Stereo with Geometric Encoding for Large-Scale Dense Scene Reconstruction, *IEEE Transactions on Automation Science and Engineering (T-ASE,* *Under Review)*, 2024.

[14] J. Wen, J. Cui, G. Yang, **B. Zhao**, Z. Gao, B. M. Chen, Progressive Domain-Adaptive Underwater Object Detection Assisted with Underwater Image Enhancement, *Engineering Applications of Artificial Intelligence (EAAI, Under Review)*, 2024.

[15] L. Long, Z. Gan, Z. Liu, **B. Zhao**, Q. Li, MSD-Det: Masonry Structures Damage Detection Dataset for Preventive Conservation of Heritage, *Journal of Cultural Heritage (Under Review), 2024*

[16] Q. Li, L. Long, X. Li, G. Yang, C. Bian, **B. Zhao**, X. Chen and Ben M. Chen, Life cycle cost analysis of circular photovoltaic façade in dense urban environment using 3D modeling, *Renewable Energy*, 2024.

[17] Q. Li, G. Yang, C. Gao, Y. Huang, J. Zhang, D. Huang, **B. Zhao**, X. Chen and B. M. Chen, Single drone-based 3D reconstruction approach to improve public engagement in conservation of heritage buildings: A case of Hakka Tulou, *Journal of Building Engineering*, 2024.

[18] Y. He, H. Xu, C. Ren, X. Liu, W. Feng, L. Zuo, Z. Huang and **B. Zhao**, Research status of preparation methods of multi-component high entropy alloy (多组元高熵合金制备方法的研究现状), *Nonferrous Metals Engineering (有色金属工程)*, 2020

**Conference Articles:**

[1] **B. Zhao**, X. Zhou, G. Yang, J. Wen, J. Zhang, X. Chen and B. M. Chen, CUBIT-Det: A high-definition infrastructure defect dataset fully evaluated with deep learning processes, *IEEE 18th International Conference on Control & Automation (ICCA)*, Reykjavík, Iceland, 2024.

[2] **B. Zhao**, Q. Duan, G. Yang, Z. Song, J. Wen, X. Liu, H. Tang, Q. Li, X. Chen and B. M. Chen, Lightweight yet High-Performance Defect Detector for UAV-Based Large-Scale Infrastructure Real-Time Inspection, submitted to *IEEE International Conference on Robotics and Automation (ICRA*), Atlanta, USA, 2025.

[3] G. Yang1, **B. Zhao1**, J. Zhang, C. Gao, Y. Huang, J. Wen, Q. Li, X. Chen and B. M. Chen, Det-Recon-Reg: An intelligent framework towards automated large-Scale infrastructure inspection, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Abu Dhabi, UAE, 2024. (1 denotes co-first author)

[4] X. Zhou, **B. Zhao**\*, G. Yang, J. Zhang, L. Li and B. M. Chen, SANet: Small but accurate detector for aerial flying object, *IEEE International Conference on Robotics and Automation (ICRA*), Yokohama, Japan, 2024. (**\*** denotes corresponding author)

[5] J. Wen, J. Cui, **B. Zhao**, B. Han, X. Liu, Z. Gao and B. M. Chen, EnYOLO: A Real-Time Framework for Domain-Adaptive Underwater Object Detection with Image Enhancement, *IEEE International Conference on Robotics and Automation (ICRA*), Yokohama, Japan, 2024.

[6] J. Wen, G. Yang, **B. Zhao**, D. Huang, Y. Hu, B. Zhang, X. Chen and B. M. Chen, I2D-UIE: Alleviating Inter- and Intra-Domain Shifts for Real-world Underwater Image Enhancement, submitted to *IEEE International Conference on Robotics and Automation (ICRA*), Atlanta, USA, 2025.

[7] G. Yang, J. Wen, **B. Zhao**, Q. Li, Y. Huang, X. Chen, A. Lam, and B. M. Chen,End-to-End Underwater Multi-View Stereo for Dense Scene Reconstruction, submitted to *IEEE International Conference on Robotics and Automation (ICRA*), Atlanta, USA, 2025.

[8]G. Yang, R. Cao, J. Wen, **B. Zhao**, Q. Li, Y. Huang, X. Chen, A. Lam, YH Liu and B. M. Chen, Multi-View Stereo with Geometric Encoding for Dense Scene Reconstruction, submitted to *IEEE International Conference on Robotics and Automation (ICRA*), Atlanta, USA, 2025.

[9] J. Wen, J. Cui, G. Yang, **B. Zhao**, Y. Zhai, Z. Gao, L. Dou and B. M. Chen, WaterFormer: Global-Local transformer for underwater image enhancement with environment adaptor, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Abu Dhabi, UAE, 2024.*

[10] J. Wen, J. Cui, G. Yang, **B. Zhao**, Z. Gao and B. M. Chen, Underwater object detection integrated with image enhancement, *IEEE International Conference on Real-time Computing and Robotics (RCAR)*, Alesund, Norway, 2024

[11] G. Yang, X. Zhou, C. Gao, **B. Zhao**, J. Zhang, Y. Chen, X. Chen and B. M. Chen, Multi-view stereo with learnable cost metric, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Detroit, Michigan, USA, 2023.

[12] X. Zhou, G. Yang, Y. Chen, C. Gao, **B. Zhao**, L. Li and B. M. Chen, ADMNet: Anti-drone real-time detection and monitoring, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Detroit, Michigan, USA, 2023.

**TEACHING ASSISTANT**

* CUHK MAEG4998 -- Final Year Project 2024-2025 by [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/)

Project Title: Deep Learning-Based Detection and Segmentation of Building Façade Defects and Components: From Dataset Establishment to Drone Experiments

* CUHK MAEG4040 -- Mechatronic System 2024-2025 by [*Prof. Xin Ma*](https://www4.mae.cuhk.edu.hk/peoples/ma-xin/)
* CUHK ESTR1006 -- Multivariable Calculus 2023-2024 by [*Prof. Dongkun Han*](https://www4.mae.cuhk.edu.hk/peoples/han-dongkun/)
* CUHK MAEG4040 -- Mechatronic System 2023-2024 by [*Prof. Xin Ma*](https://www4.mae.cuhk.edu.hk/peoples/ma-xin/)
* CUHK MAEG5910 -- Master of Science Project 2023-2024 by [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/)

Project Title: Learning-Based Large-Scale 3D Reconstruction: A Comparison between Multi-View Stereo and Neural Radiance Field

* CUHK MAEG5910 -- Master of Science Project 2022-2023 by [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/)

Project Title: Building Defects Detection based on YOLOv8

* CUHK MAEG4040 -- Final Year Project 2022-2023 by [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/)

Project Title: Building Defect Dataset Establishment and Real-time Defect Detection

* CUHK MAEG5910 -- Master of Science Project 2021-2022 by [*Prof. Ben M. Chen*](https://www4.mae.cuhk.edu.hk/peoples/chen-benmei/)

Project Title 1: Defect Images Generation based on Generative Adversarial Network

Project Title 2: Concrete Cracks Detection based on Semantic Segmentation

Note: MAEG (Mechanical and Automation Engineering)机械与自动化工程系课程; ESTR (ELITE Stream)工程学院精英班课程

**INTERNSHIP & WORK**

** Hong Kong Centre for Logistics Robotics(香港物流机器人研究中心) &**

卡通人物

低可信度描述已自动生成**The Chinese University of Hong Kong (香港中文大学)** 2021.07 - 2022.08

**Position**: Research Assistant **(科研助理)** for unmanned system based computer vision tasks

** Luoyang** **YTO Group Corporation (洛阳中国第一拖拉机厂)** 2019.10 - 2019.11

**Position**: Mechanical Engineer **(机械工程师)**

 **Jinling Branch of** **Sinopec (南京金陵石化****)** 2016.06 - 2016.08

**Position**: Mechanical Engineer **(机械工程师)** 2017.06 - 2017.08

**HONORS & AWARDS**

* **Gold Award** – Chun Wo Innovation Student Awards 2022 (香港俊和学生创新奖), Hong Kong, 2023.11
* **Best Business Potential Award** (**最佳商业潜力奖**) -- Chun Wo Innovation Student Awards 2022 (香港俊和学生创新奖), Hong Kong, 2023.11
* **Best Business Idea Award** (**最佳商业创意奖**) -- Young Entrepreneurs Development Council (香港青年企业家发展局), Hong Kong, 2023.07
* **Champion** -- Professor Charles K. Ko Student Creativity Award (高琨教授学生创新奖), CUHK, Hong Kong, 2023.06
* **Bronze Medal** -- 48th Geneva International Exhibition of Inventions (日内瓦国际发明展), Geneva, Switzerland, 2023.04
* **Postgraduate Scholarship** (**研究生全额奖学金**) -- CUHK, Hong Kong, 2022-2026
* **Outstanding Undergraduate of the 2020 Class** (**2020届优秀本科毕业生**) -- Jiangsu Ocean University, Lianyungang, China, 2020
* **First Class Annual Scholarship** (**年度一等奖学金**) -- Jiangsu Ocean University, Lianyungang, China, 2019-2020
* **Competition-based Individual Scholarship** (**单项竞赛奖学金**) -- Jiangsu Ocean University, Lianyungang, China, 2019.10
* **Second Prize** -- China RoboWork 2019 (中国工程机器人大赛) Small Quadrotor Project Shaoguan, China, 2019.04
* **Merit Student** (**三好学生**) -- Jiangsu Ocean University, Lianyungang, China, 2018-2019
* **First Class Annual Scholarship** (**年度一等奖学金**) -- Nanjing Tech University, Nanjing, China, 2018-2019
* **Champion** -- ‘Engineer Training Cup’ Mechanical Manufacturing and Innovative Design Competition Solar Power Car Project (**“工程训练杯”机械制造创新设计大赛太阳能车组**), Jiangsu Ocean University, Lianyungang, China, 2018.07
* **First Class Annual Scholarship** (**年度一等奖学金**) -- Jiangsu Ocean University, Lianyungang, China, 2017-2018
* **Outstanding Student Union Cadre** (**优秀学生会干部**) -- Jiangsu Ocean University, Lianyungang, China, 2017-2018
* **Outstanding Communist Youth League Cadre** (**优秀共青团干部**) -- Jiangsu Ocean University, Lianyungang, China, 2017-2018
* **First Class Annual Scholarship** (**年度一等奖学金**) -- Jiangsu Ocean University, Lianyungang, China, 2016-2017
* **Outstanding Student Union Member** (**优秀学生会成员**) -- Jiangsu Ocean University, Lianyungang, China, 2016-2017
* **Outstanding Communist Youth League Member** (**优秀共青团员**) -- Jiangsu Ocean University, Lianyungang, China, 2016-2017

**TECHNICAL SKILLS**

* Robotics & Deep Learning: C++, Python, Linux, ROS, Gazebo, Pytorch, Keras, PCL, CloudCompare, MeshLab, OpenCV, Open3D, etc.
* 3D & 2D Modeling: Creo, Solidworks, AutoCAD, ANSYS, etc.
* Numerical Analysis and Statistics: Numpy, Scipy, Scikit-Learn, Pandas, Matlab, etc.
* Control System: Labview, Matlab & Simulink, PLC, Python, etc.