

Long BAI

PERSONAL INFORMATION

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EDUCATION

Department of Electronic Engineering, The Chinese University of Hong Kong, China 2021.08-2025.07

- ✦ **Degree & Major:** Doctor of Philosophy, Electronic Engineering
- ✦ **Advisor:** [Prof. Hongliang Ren](#), SMIEEE, RPAI (Robotics, Perception and AI) Group
- ✦ **CUHK Vice-Chancellor's Ph.D. Scholarship Scheme**

School of Optics and Photonics, Beijing Institute of Technology (BIT), China 2017.09-2021.06

- ✦ **Degree & Major:** Bachelor of Science, Opto-Electronics Information Science and Engineering
- ✦ **CGPA:** 3.55/4.0
- ✦ **Advisor:** [Prof. Kun Gao](#)

INTERNSHIP & VISITS

Department of Engineering, University of Cambridge, UK 2021.12-2021.12

- ✦ **Program:** [Winter School in Smart Materials for Soft Robots](#)
- ✦ **Activities & Societies:** Fundamentals of Smart (self-healing, sensing, actuating) Materials, Biology and Design, Actuation, Sensing and Control/AI in Soft Robotics

School of Information and Electronics, Beijing Institute of Technology, China 2020.08-2020.11

- ✦ **Position:** Research Intern in Digital Image Processing
- ✦ **Advisor:** [Dr. Mingfeng Lu](#), Beijing Key Laboratory of Fractional Signals and Systems

Department of Electrical and Computer Engineering, University of Miami, USA 2020.06-2020.08

- ✦ **Position:** Research Intern in Medical Image Analysis
- ✦ **Advisor:** [Prof. Mohamed Abdel-Mottaleb](#), FIEEE, Chair Professor

ACADEMIC AWARDS

✦ **CUHK Vice-Chancellor's Ph.D. Scholarship Scheme** 2021.08-2025.07

Awarded to top applicants to the Ph.D. programme in CUHK. Eligibility: a clear record of academic and/or research achievements, a high degree of intellectual curiosity combined with creativity, and potential for academic/professional leadership.

✦ **Best Student Paper Award, ICBIR 2023** 2023

*As the **presenting** author, awarded to student papers judged to be the best in ICBIR 2023. Awards are scored by the Award Committee Chairs.*

✦ **Best Poster Award, IEEE ICRA 2023 Workshop on Surgical Robotics** 2023

*As the **presenting** author, awarded to top presenters among 30 groups in ICRA 2023 Workshop on New Evolutions in Surgical Robotics: Embracing Multimodal Imaging Guidance, Intelligence, and Bio-inspired Mechanisms. Awards are voted by the invited speakers/guests.*

✦ **IEEE ICRA 2023 RAS Travel Grants Award** 2023

Awarded to participants who is going to present papers at ICRA 2023, applications are reviewed on a competitive basis.

✦ **Merit Award, The Engineering Medical Innovation Global Competition (EMedIC Global)** 2021

Awarded to finalist teams in Medical Innovation Global Competition 2021.

✦ **BIT Academic Excellent Scholarship** 2020

Awarded to top 5% undergraduate students in the university.

PUBLICATIONS

(† indicates equal contribution, * represents the corresponding authors.)

CONFERENCES:

- [1] **Sample-adaptive Augmentation for Point Cloud Recognition Against Real-world Corruptions**
Jie Wang, Lihe Ding, Tingfa Xu, Shaocong Dong, Xinli Xu, Long Bai, Jianan Li*
19th International Conference on Computer Vision (ICCV), 2023.
- [2] **LLCaps: Learning to Illuminate Low-Light Capsule Endoscopy with Curved Wavelet Attention and Reverse Diffusion**
Long Bai[†], Tong Chen[†], Yanan Wu, An Wang, Mobarakol Islam, Hongliang Ren*
26th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2023.
(Oral, Top 3%)
- [3] **Revisiting Distillation for Continual Learning on Visual Question Localized-Answering in Robotic Surgery**
Long Bai[†], Mobarakol Islam[†], Hongliang Ren*
26th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2023.
- [4] **Co-Attention Gated Vision-Language Embedding for Visual Question Localized-Answering in Robotic Surgery**
Long Bai[†], Mobarakol Islam[†], Hongliang Ren*
26th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2023.
- [5] **Surgical-VQLA: Gated Vision-Language Embedding for Visual Question Localized-Answering in Robotic Surgery**
Long Bai[†], Mobarakol Islam[†], Lalithkumar Seenivasan, Hongliang Ren*
40th IEEE International Conference on Robotics and Automation (ICRA), 2023.
(RAS Travel Grant Award)
- [6] **Landmark Detection using Transformer Toward Robot-assisted Nasal Airway Intubation**
Tianhang Liu, Hechen Li, Long Bai, Yanan Wu, An Wang, Mobarakol Islam, Hongliang Ren
International Conference on Biomimetic Intelligence and Robotics & Medical Robotics Forum (ICBIR), 2023.
(Best Student Paper Award)
- [7] **Semi-supervised Learning for Segmentation of Bleeding Regions in Video Capsule Endoscopy**
Hechen Li, Yanan Wu, Long Bai, An Wang, Tong Chen, Hongliang Ren
International Conference on Biomimetic Intelligence and Robotics & Medical Robotics Forum (ICBIR), 2023
- [8] **Deep Reinforcement Learning-Based Control for Stomach Coverage Scanning of Wireless Capsule Endoscopy**
Yameng Zhang[†], Long Bai[†], Li Liu*, Hongliang Ren*, Max Q.-H. Meng
18th IEEE International Conference on Robotics and Biomimetics (ROBIO), 2022.
- [9] **The Influence of Age and Gender Information on the Diagnosis of Diabetic Retinopathy: Based on Neural Network**
Long Bai^{†*}, Sihang Chen[†], Mingyang Gao[†], Lelia Abdelrahman, Manal Al Ghamdi, Mohamed Abdel-Mottaleb
43rd International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2021.

JOURNALS:

- [1] **Rethinking Exemplars for Continual Semantic Segmentation in Endoscopy Scenes: Entropy-based Mini-Batch Pseudo-Replay**
Guankun Wang[†], Long Bai[†], Yanan Wu, Tong Chen, Hongliang Ren*
Computers in Biology and Medicine (CBM), 2023. (IF: 7.7)
- [2] **Rethinking Pain Communication for Dementia: Interaction Design using E-textile**
Yanheng Li, Long Bai, Yaxuan Mao, Hongliang Ren, Yu Qiao, Xin Tong, Ray LC*
Frontiers in Physiology, 2023. (IF: 4.0)
- [3] **Two-stage Contextual Transformer-based Convolutional Neural Network for Airway Extraction from**

CT Images

Yanan Wu, Shuiqing Zhao, Shouliang Qi*, Jie Feng, Haowen Pang, Runsheng Chang, **Long Bai**, Mengqi Li, Shuyue Xia, Wei Qian, Hongliang Ren*
Artificial Intelligence in Medicine, 2023. (IF: 7.5)

- [4] **Domain Adaptive Sim-to-Real for Oropharyngeal Organs Segmentation**
 Guankun Wang, Tian-Ao Ren, Jiewen Lai, **Long Bai**, Hongliang Ren*
Medical & Biological Engineering & Computing (MBEC), 2023. (IF: 3.2)
- [5] **Transformer-based 3D U-Net for Pulmonary Vessel Segmentation and Artery-vein Separation from CT Images**
 Yanan Wu, Shouliang Qi*, Meihuan Wang, Shuiqing Zhao, Haowen Pang, Jiaxuan Xu, **Long Bai**, Hongliang Ren*
Medical & Biological Engineering & Computing (MBEC), 2023. (IF: 3.2)
- [6] **An RNN-LSTM Enhanced Compact and Affordable Micro Force Sensing System for Interventional Continuum Robots with Interchangeable End-Effector Instruments**
 Shilong Yao[†], Ruijie Tang[†], **Long Bai**, Hong Yan, Hongliang Ren*, Li Liu*
IEEE Transactions on Instrument & Measurement (T-IM), 2022. (IF: 5.6)
- [7] **Transformer-based Disease Identification for Small-scale Capsule Endoscopy Dataset**
Long Bai, Liangyu Wang, Tong Chen, Yuanhao Zhao, Hongliang Ren*
Electronics, 2022. (IF: 2.9)

WORKSHOPS & POSTERS:

- [1] **Sim-to-Real Segmentation in Robot-assisted Transoral Tracheal Intubation**
 Guankun Wang, Tian-Ao Ren, Jiewen Lai, **Long Bai**, Hongliang Ren*
40th IEEE International Conference on Robotics and Automation (ICRA), 2023, Workshop on New Evolutions in Surgical Robotics.
(Best Poster Award)
- [2] **The Exploration and Evaluation of Using Neural Style Transfer in Generating Affective 360° Panoramic VR Environments**
 Yanheng Li, **Long Bai**, Yaxuan Mao, Xuening Peng, Zehao Zhang, Xin Tong*, Ray LC*
30th IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 2023, Poster.

PREPRINT & UNDER REVIEW:

- [1] **Surgical Tool Classification and Localization: Results and Methods from the MICCAI 2022 SurgToolLoc Challenge**
 Aneeq Zia, Kiran Bhattacharyya, Xi Liu, Max Berniker, Ziheng Wang, Rogerio Nespolo, ..., **Long Bai**, et al.
ArXiv Preprint ArXiv:2305.07152.
- [2] **Learning Monocular Depth and Ego-motion for Multimodal Wireless Capsule Endoscopy**
 Liangyu Wang[†], **Long Bai**[†], Shilong Yao, Yanheng Li, Sishen Yuan, Yanan Wu, Yang Zhang, Max Q.-H. Meng, Zhen Li, Hongliang Ren*
Artificial Intelligence in Medicine, 2023, Under Review.
- [3] **Revisiting Consistent and Contrastive Augmentations in Semi-supervised Skill Assessment in Robotic Surgery**
Long Bai[†], Qiaozhi Tan[†], Wenzhen Dong, Lalithkumar Seenivasan, Beilei Cui, An Wang, Mobarakol Islam, Hongliang Ren*
International Journal for Computer Assisted Radiology and Surgery (IJCARs), IPCAI 2024 Special Issue, Under Review.
- [4] **Towards Open-Set Surgical Activity Recognition in Robot-assisted Surgery**
Long Bai[†], Guankun Wang[†], Jie Wang, Xiaoxiao Yang, Huxin Gao, Xin Liang, An Wang, Mobarakol Islam, and Hongliang Ren*
40th IEEE International Conference on Robotics and Automation (ICRA), Under Review, 2023.
- [5] **Privacy-Preserving Synthetic Continual Semantic Segmentation for Robotic Surgery**
 Mengya Xu[†], Mobarakol Islam[†], **Long Bai**, Hongliang Ren*

IEEE Transactions on Medical Imaging (T-MI), 2023, Under 2nd Review.

[6] **Joint Sparse Representations and Coupled Dictionary Learning in Multi-Source Heterogeneous Image Pseudo-color Fusion**

Long Bai, Shilong Yao, Kun Gao*, Yanjun Huang, Ruijie Tang, Hong Yan, Max Q.-H. Meng, Hongliang Ren*
IEEE Sensors Journal, 2023, Under 3rd Review.

PROFESSIONAL ACTIVITIES

★ Journal Reviews:

IEEE Transactions on Medical Imaging (T-MI)
 IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)
 IEEE Transactions on Instrumentation and Measurement (T-IM)
 Medical & Biological Engineering & Computing (MBEC)
 IEEE Open Journal of Instrumentation & Measurement (OJIM)
 Journal of Systems and Control Engineering (JSCE)
 Journal of Medical Robotics Research (JMRR)

★ Conference Reviews:

International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
 International Conference on Information Processing in Computer-Assisted Interventions (IPCAI)
 ACM CHI Conference on Human Factors in Computing Systems (CHI)
 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)
 ACM SIGCHI Conference on Computer-Supported Cooperative Work & Social Computing (CSCW)
 ACM Symposium of Eye Tracking Research & Applications (ETRA)
 ACM Conference on Intelligent User Interfaces (IUI)

★ Invited Talk

2023, *Surgical Visual Question Localized-Answering*, Pre-ICRA Online
 2022, *Lifelong Learning: Background, Methodology and Applications*, HKUST UG

TEACHING EXPERIENCE

★ Thesis/Final Year Project TA and Mentorship

CUHK Graduates in 2023 (With Prof. Hongliang Ren):

Tianhang Liu, M.Sc. EE, *Airway Intubation Landmark Detection using Transformer*
 Chung Hei Tse, B.Eng. EE, *Application of Web-based AR to Medical Education Through Three.js*

CUHK Graduates in 2022 (With Prof. Hongliang Ren):

Liangyu Wang, M.Sc. EE, *Endoscope Perception Algorithms based on Multimodal Fusion*
 Yuanhao Zhao, M.Sc. EE, *Ultrasound Needle Segmentation*
 Chi Hung Li, B.Eng. EE, *Develop Representative Image-guided Robotic Procedures with Virtual Reality Modules*

★ Teaching Assistant

Intelligent Wearable Electronics (ELEG5757), CUHK, with Prof. Hongliang Ren	2023.01-2023.04
Robotic Perception and Intelligence (ELEG3103), CUHK, with Prof. Hongliang Ren	2023.01-2023.04
Probability for Engineers (ENGG2760), CUHK, with Prof. Hongliang Ren	2022.09-2022.12
Microelectronic Devices and Circuits (ELEG3201), CUHK, with Prof. Kong Pang Pun	2022.01-2022.04
Probability for Engineers (ENGG2760), CUHK, with Prof. Hongliang Ren	2021.09-2021.12

STANDARDIZED TEST SCORES

- ★ **TOEFL iBT:** Total 117 (Reading 30, Listening 30, Speaking 27, Writing 30), 2020.09.16
- ★ **GRE:** Verbal 168 (98%), Quantitative 170 (96%), Analytical Writing 4.0 (55%), 2020.10.11

SKILLS

- ★ **Proficient:** Python, PyTorch, MATLAB, C/C++, LaTeX, Ubuntu
- ★ **Skilled:** Adobe Premiere, Unity3D

SOCIAL WORKS AND HONORS

- ★ 2nd Runner-up, National Day Football Cup of Hong Kong Science, Technology, and Innovation Industry 2023
- ★ 3rd Runner-up, CUHK Alumni Football Cup 2022
- ★ Championship, BIT Super Football League 2021

✦	1 st Runner-up, Beijing Fangshan District Futsal Competition	2019
✦	Head, BIT Campus Broadcasting Department	2018
✦	Executive Head, BIT Campus Press Corps	2018
✦	BIT Outstanding Student Reporter	2018