# Long BAI

## PERSONAL INFORMATION

- **Email:** b.long@link.cuhk.edu.hk, b.long@ieee.org, bailong2021@outlook.com
- **Cell Phone:** (+86) 188-0013-9673, (+852) 5960-7217
- **Address:** Room 424, Ho Sin-Hang Engineering Building, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR, China

## 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.)

**PREPRINT**
[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.*

**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)*

[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, (Oral).*

**JOURNALS:**
[1] **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*
*Information Fusion, 2023, Under Review. (IF: 18.6)*

[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, Under 2nd Review, 2023. (IF: 4.0)*

[3] **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, Under 2nd Review. (IF: 7.7)*

[4] **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. (IF: 4.3)*

[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. (IF: 10.6)*

[6] **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)*

[7] **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)*

[8] **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)*

[9] **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)*

[10] **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] **SAM Adapter for Kidney Tumor Segmentation**
Yihan Ma, Mobarakol Islam, **Long Bai**, Beilei Cui, Hongliang Ren
*3rd International Challenge on Kidney and Kidney Tumor Segmentation (KiTS), 2023, Submitted.*

[2] **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)***

[3] **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.*

**PROFESSIONAL ACTIVITIES**
✦  **Journal Reviews:**

IEEE Transactions on Medical Imaging (T-MI)
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)

✦ **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**

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|---|---|
| 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

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|---|---|
| ✦ 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 |
| ✦ 1st 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 |