# Christina Zong-Hao Ma (PhD, CPO, CRT)


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Department of Biomedical Engineering
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## Education & Professional Qualifications

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|---|---|
| 2013.12-2017.12 | **PhD** in **Prosthetics Orthotics and Rehabilitation Engineering** (awarded Sep 2018), Faculty of Engineering, The Hong Kong Polytechnic University, Hong Kong SAR |
| 2008.09-2012.06 | **BSc** in **Prosthetics & Orthotics (P&O)** (Honor of Outstanding Graduate)**,** West China School of Medicine, Sichuan University, Chengdu, China |
| 2012.06 | **Certified Prosthetist & Orthotist (CPO, ISPO Category I)** International Society for Prosthetics and Orthotics (ISPO-SICH005). |
| 2013.05 | **Certified Rehabilitation Therapist (CRT)** National Health and Family Planning Commission (currently National Health Commission), China (13207211). |

## Academic & Clinical Experience

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|---|---|
| 2020.07- present | **Assistant Professor** (Lab in-charge: Gerontechnology Lab), Department of Biomedical Engineering, The Hong Kong Polytechnic University (PolyU), Hong Kong SAR |
| 2020.04-2020.06 | **Assistant Professor** (Universitetslektor, permanent position), Department of Rehabilitation, Jönköping University, Jönköping, Sweden |
| 2018.12-2020.03 | **Lecturer** in Prosthetics & Orthotics (Universitetsadjunkt, 1-year teaching position), Department of Rehabilitation, Jönköping University, Jönköping, Sweden |
| 2017.12-2018.11 | **Postdoctoral Research Associate** in Biomedical Ultrasound Imaging, Department of Biomedical Engineering, PolyU, Hong Kong SAR |
| 2017.06-2017.12 | **Visiting Research Scholar** in Mechanical Engineering, College of Engineering, University of Michigan, Ann Arbor, USA |
| 2012.07-2013.12 | **Certified Prosthetist & Orthotist / Clinical Instructor** (permanent employment), Prosthetic and Orthotic Center, China Rehabilitation Research Center, Beijing, China |
| 2011.07-2012.06 | **Intern Prosthetist & Orthotist,** Prosthetic and Orthotic Center, Sichuan Rehabilitation Center, Chengdu, China<br>Prosthetic and Orthotic Center, West China Hospital, Chengdu, China |

## Research Overview

**Research Interests:**

Aging & Disability
Posture, Balance & Gait
Rehabilitation Engineering
Active Health
Fall Prevention
Smart Aging Solution

**Research Impact** as of September 2023:

*h*-index per Web of Science: 9
*h*- / *h10*-index per Google Scholar: 11 / 11
total citations per Web of Science: 266
total citations per Google Scholar: 432

# Teaching Experience

## The Hong Kong Polytechnic University (2020 onward):

| | | | |
|---|---|---|---|
| *Guided Study in Biomedical Engineering I/II/III* (BME6851-6853, 3 credits) | **Subject Coordinator** | EngD | Sem 1-2, since 2023 |
| *Guided Study in Biomedical Engineering II* (BME6852, 3 credits) | Supervisor | EngD | Sem 2, since 2021 |
| *Guided Study in Biomedical Engineering I* (BME6851, 3 credits) | Supervisor | PhD/ MPhil | Sem 2, since 2021 |
| *Advanced Topic in Biomedical Engineering* (BME6000, 3 credits) | Lecturer | PhD/ MPhil | Sem 1, since 2021 |
| *Wearable Technology for Digital Health* (BME5111, 3 credits, **new course**) | **Subject Leader** | MSc | Sem 1, since 2022 |
| *Rehabilitation Engineering* (BME5134, 3 credits) | Lecturer | MSc | Sem 2, since 2021 |
| *Digital Design and Fabrication for Healthcare Services* (BME 42154, 3 credits, **new course**) | Lecturer | BSc | Sem 1-2, since 2023 |
| *Capstone Project* (BME41118, 6 credits) | Supervisor | BSc | Sem 1-2, since 2020 |
| *Rehabilitation Engineering and Assistive Technology* (BME31134, 3 credits, Theory & Practice, **revamped course**) | **Subject Leader** | BSc | Sem 2, since 2021 |
| *Assistive Technologies: Service Learning towards the Elderly and Disabled* (BME3S02, 3 credits, **2 cohorts per academic year**) | **Subject Leader** | BSc | Sem 1-2 & Sem 2-3, since 2020 |
| *Technologies for Smart Ageing* (BME1D03, 3 credits, **2 cohorts per academic year**) | Lecturer | BSc | Sem 1&Sem 2, since 2020 |
| *Biomedical Engineering in Society* (BME11108, 1 credit) | **Subject Leader** | BSc | Sem 1-2, 2020-2022 |

## Jönköping University (2018-2020):

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|---|---|---|---|
| *Prosthetics & Orthotics, Thesis* (HOEP11, 15 credits) | **Course Coordinator** | BSc | 2020 Spring |
| *Scientific Method and Statistics* (HSCG10, 7.5 credits, **new course**) | Lecturer | BSc | |
| *Prosthetic Management & Biomechanics of the Lower Limb I* (HPMK19, 15 credits, Theory & Practice) | **Course Coordinator** | BSc | |
| *Orthotic Management & Biomechanics I* (HO1K19, 15 credits) | Lecturer | BSc | |
| *Orthotic Management & Biomechanics I* (HO1K19, 15 credits, Theory & Practice, **new course**) | **Course Coordinator** | BSc | 2019 Fall |
| *Prosthetic & Orthotic Management of the Upper Limb* (HOLK19, 7.5 credits, Theory & Practice, **new course**) | Lecturer | BSc | |
| *Prosthetics & Orthotics, Theory* (HPON1, 10.5 credits) | Lecturer | BSc | |
| *Prosthetic Management & Biomechanics of the Lower Limb I* (HPMK19, 15 credits, Theory & Practice, **new course**) | **Course Coordinator** | BSc | 2019 Spring |
| *Prosthetics & Orthotics - Foot Orthotics* (HOTN11, 30 credits, Practice) | Lecturer | BSc | |
| *Prosthetics & Orthotics, Thesis* (HOEP11, 15 credits) | Supervisor | BSc | |
| *Biomechanics - Calculations* (HBMK14, 7.5 credits) | **Course Coordinator** | BSc | 2018 Fall |

# Awards & Honors

1. **Co-innovation Award**, Health Future Challenge 2023, Knowledge Transfer and Entrepreneurship Office, PolyU (Supervisee: ZHU Tanglong, HUANG Chen, TONG Cheuk Ying, HUNG Tim Mei; "Towards more effective fall-risk assessment and balance training: A smart balance-perturbation system", Ref. No.: HFC23-17) (2023).
2. **Oral Presentation Competition (1st Runner-up)**, 2023 China Biomedical Engineering Conference & Medical Innovation Summit 2023 (BME2023) 中国生物医学工程大会暨创新医疗峰会（BME2023）口头报告一等奖 (Supervisee: LIU Wei) (2023).
3. **Best Abstract Award (Group) - Prosthetics and Orthotics Outstanding Capstone Project Award**, the 7th Singapore Rehabilitation Conference & 7th Asian Prosthetics and Orthotics Scientific Meeting (SRC – APOSM 2022) (Supervisee: TONG Cheuk Ying, Charmaine) (2022).
4. **Champion of Best Project Award, Inter-departmental Final Year Project 2021-22**, Faculty of Engineering, PolyU (Supervisee: WONG Hok Man, Leon; Project: Proactive Companion Robot) (2022).
5. **Service-Learning Scholarship - FYP / Capstone Project (2021/22)**, Service-Learning and Leadership Office, PolyU (Supervisee: TONG Cheuk Ying, Charmaine) (2021).
6. **Pedagogic Award 2020,** School of Health and Welfare - Education Committee (Hälsohögskolans Utbildningsutskott, HUTT), Jönköping University (2020).
7. **Travel Sponsorship** to attend the 17th ISPO World Congress 2019, International Society for Prosthetics and Orthotics - Hong Kong Society (ISPO-HK) (2019).
8. **Distinguished Alumni Award**, School of Rehabilitation Sciences, West China School of Medicine, Sichuan University (2018).
9. **The Hong Kong Special Administrative Region Government Scholarship - Reaching Out Award**, Education Bureau, Hong Kong Special Administrative Region Government (2017).
10. **Travel Stipend** to attend the 16th ISPO World Congress 2017, International Society for Prosthetics and Orthotics (ISPO) (2017).
11. **Student Research Award (Top Prize)**, Hong Kong Medical and Healthcare Device Industries Association (HKMHDIA) (2016).
12. **Outstanding Paper Award**, The 10th Beijing International Forum on Rehabilitation (2015).
13. **Research Postgraduate Studentship**, PolyU (2015-2017).
14. **Outstanding Individual Award** of organization committee, the 6th National Congress, China Disabled Persons Federation (2013).
15. **Outstanding Graduate Award**, Sichuan University (2012).
16. **National Scholarship**, Ministry of Education, China (2010).

# Grants

(Total funded number / amount as Principal Investigator/Co-PI: ≥ **11** / **HK$2.6M**; Donation: ≥ **1** / **HK$6.0M**)

## External Grants as Principal Investigator (PI) / Co-PI

1. **Hong Kong Research Grants Council (RGC) - Early Career Scheme (ECS).** "A Novel, Wearable, Ultrasound-Imaging-Based Visual Feedback (UVF) Training Strategy for Improving Muscle

Function and Physical Activity of Community-Dwelling Stroke Survivors: A Randomized Controlled Trial (Ref: 25100523)". HK$883,254, 2023/09/01-2026/08/31 (**PI: MA Zonghao**; Collaborator: WONG Arnold, YANG Lin, ZHENG Yongping).

2. **Hong Kong Research Grants Council (RGC) Direct Allocation Grant - Funding Support to Small Projects, The Hong Kong Polytechnic University**. "Investigating Mechanism of Falls in Older Individuals from Muscle Activity Perspective by An Innovative Wearable Ultrasound Imaging System: A Pilot Study (Ref: P0036830, PB1J)". HK$200,000, 2021/07/01-2023/06/30 (**PI: MA Zonghao**).
3. **Hu Nan Disabled Person's Federation, Hunan Province, China**. "Towards Smart Rehabilitation: Needs of Smart Wearable Balance-enhancing Devices in People with Disabilities at Hunan Province (Ref: 2019XK028)". CN¥20,000, 2020/01/01-2021/12/31 (PI: ZHOU Yujing, **Co-PI: MA Zonghao**; Co-I: HUANG Mengjie, ZOU Yingjie, ZHAO Dongfeng, XIONG Dan, MA Rui)
4. **Science & Technology Entrepreneur Programme (STEP), Hong Kong Science and Technology Parks (HKSTP) Corporation**. "iBalanx – Smart Insole with Instant Reminder to Improve Balance and Walking (Interactive HealthTech Limited, STEP ID: 219)". HK$100,000, 2019/04/01-2020/04/28 (with technologies derived from my PhD research; **Supervisor and International partner: MA Zonghao**; Team members: CHUNG Alan, HUANG Zihao, CHENG Connie, ZHENG Yongping).

## Donations as PI / Co-PI

5. **Zhengzhou Alien Capsule Medical Equipment Co., Ltd./ Chairman of the Board (ZHANG Xinmin)- Alien Capsule Spinal Decompression System (3 sets)**. "Developing a novel treatment strategy and protocol for patients with adolescent idiopathic scoliosis (AIS)". Donation Cash In-kind, HK$6,000,000, 2023/05/25 (**Co-PIs**: Dr. WONG Man Sang & **Dr. MA Zonghao**).

## Internal Grants as PI / Co-PI

6. **Undergraduate Research and Innovation Scheme (URIS), The Hong Kong Polytechnic University**. "A sensor-based system for monitoring and providing feedback on physical activity in older adults. (Ref: P0047968, TAEE, URIS2023-062)". HK$30,000, 2023/09/01-2024/08/31 (**PI: MA Zonghao** (BME 25% + EEE 75%); Supervisee: Mr. XU Zhuoning Johnny, EEE - Department of Electrical and Electronic Engineering).
7. **Seed Fund for Promoting Digital Literacy, Teaching Development Grant (TDG) for 2022-25, The Hong Kong Polytechnic University**. "Seed Fund for Promoting Digital Literacy - Department of Biomedical Engineering (Ref: 49AZ)". HK$100,000, 2023/06/01-2024/05/31 (**PI: MA Zonghao**, Co-I: WONG Man-Sang, KOBAYASHI Toshiki). **(Learning & Teaching Project)**
8. **"Tell Your Story: Demonstrate Your Impact" - Support from the Department, Department of Biomedical Engineering, The Hong Kong Polytechnic University**. "Towards more effective fall assessment, monitoring, and prevention in older and/or disabled people (Ref: 9BH7)". HK$200,000, 2023/04/24-2024/06/30 (**PI: MA Zonghao**).
9. **Funding for Strategic Plan Initiatives to Enhance the Student Learning Experience through the Use of Interactive Pedagogies 2021-22 (2nd round), The Hong Kong Polytechnic University**. "Innovative co-creation of multimedia in teaching to engage students in enquiry-based active learning (Ref: SPF21-22/A1/BME01, 8CTK)". HK$150,000, 2022/05/16-2023/06/30 (**PI: MA Zonghao**; Co-PI: HU Xiaoling; Co-I: WEN Chunyi, WANG Yan, CHEUNG James, LI Yan, WONG Man-Sang). **(Learning & Teaching Project)**

10. **Research Institute for Smart Ageing (RISA), The Hong Kong Polytechnic University**. "Prevention, Evaluation, and Monitor of Falls in Older Adults with Big Data Analytics: Towards an Objective and Cost-effective Approach (Ref: P0038945, CD64)". HK$400,000, 2021/09/16-2024/03/15 (**PI: MA Zonghao**, Co-PI: WONG Arnold; Co-I: YANG Lin, FU Hong, BAI Xue, WONG Man Sau, ZHENG Yong-Ping, CHEUNG James).
11. **Start-up Fund for New Recruits, The Hong Kong Polytechnic University.** "Physiological and Biomechanical Study of Postural Balance Controlling Mechanism in Young and Older Adults (Ref: P0034491, BE48)". HK$500,000, 2020/12/01-2023/12/31 (**PI: MA Zonghao**).
12. **PolyU Lean LaunchPad Programme (Fashion & Wearable Technology), Institute for Entrepreneurship, The Hong Kong Polytechnic University**. "iBalanx – Smart Insole with Vibrotactile Biofeedback to Improve Balance (Ref: LLP-18-007)". HK$50,000, 2018/04/01-2018/06/30 (with technologies derived from my PhD research; **Entrepreneurial Lead: MA Zonghao**, Team members: HUANG Zihao; Entrepreneurial Mentor: Dr. BROWN Donna, Academic Mentor: Prof. ZHENG Yongping).

## External Grants as Co-Investigator (Co-I)

13. **Innovation and Technology Fund for Better Living, HKSAR.** "Smart Knee Ambassador: Deep Learning-enabled Knee Osteoarthritis Community Screening and Rehabilitation Program (膝智康健：社區膝關節炎智能篩查及復康計劃) (Ref: FBL/B046/22/S)". HK$ 3,057,058.8, 2023/09/01-2026/08/31 (PI: WEN Chunyi; Co-PIs: LIU Justina, SO Billy; **Co-Is**: **MA Zonghao**, CHEUNG Chung Wai James).
14. **Innovation and Technology Support Programme (ITSP) (Platform), HKSAR.** "Intelligent Wearable System for Impact Safety Protection and Real-Time Monitoring (Ref: P0044656)". HK$3,777,777.78, 2023/03/31-2025/03/30 (PI: SHOU Dahua; Co-I: TAO Xiaoming, FAN Jintu, YE Lin, **MA Zonghao**)
15. **Sports Science and Research Funding Scheme ("SSRFS"), HKSAR.** "An Intelligent multi-modal system for Boccia training (Ref: xxx)". HK$5,980,000, 2022/09/01-2024/08/31 (PI: FU Hong; Co-I: LING Man Ho Alpha, SONG Yanjie, YU Leung Ho Philip, TONG Xiuhong, SUN Fenghua, CHOW Hung Kay Daniel, **MA Zonghao**)
16. **Health and Medical Research Fund (HMRF) Fellowship, HKSAR**. "Effects of a Physical-Psychological Integrative (PPI) intervention on Physical inactivity, Depression and Chronic pain for Community-Dwelling Spinal Cord Injury Survivors: a Pilot Randomized Controlled trial (Ref: FHB/H/41/69, 06200147)". HK$952,685, 2021/07/01-2023/06/30 (PI: LI Yan; Co-I: YIM Chor Pik Rabi, WONG Yu Lok Arnold, BRESSINGTON Daniel Thomas, YEUNG Wing-Fai, **MA Zonghao**, KOR Pui Kin, MOLASIOTIS Alex)
17. **Innovation and Technology Support Programme (ITSP), Innovation and Technology Commission, HKSAR.** "Exo-neuro-musculo-skeleton with Balance Sensing Feedback for Ankle-foot Rehabilitation after Stroke (Ref: ITS/062/19)". HK$1,256,375, 2020/03/01-2022/02/28 (PI: HU Xiaoling; Co-I: **MA Zonghao**).

## Internal Grants as Co-I

18. **TDG 2022-25 Round 2 - Category A, Projects on deepening VTL adoption, The Hong Kong Polytechnic University**. "Development of a team-building e-platform for improving students' teamwork in inter-disciplinary subjects (TDG22-25/R2/VTL-5, 1.4Y.XX.49T1)". HK$ 404,534, 2023/07/01-2024/12/31 (PI: KAR Fung Yi; Co-I: LAU Hin Chung, NGAI Grace, MUI Kwok Wai

Horace, WONG Ling Tim, NG Hiu Fung Peter, KOR Pui Kin, **MA Zonghao**, LAM Chi Hin, LAI Po Yan, LAU Chun Fai Ivan, PANG, Chun Yu). **(Learning & Teaching Project)**

19. **Research Institute for Sports Science and Technology (RISports), The Hong Kong Polytechnic University**. "Exploration of Knee Joint Protection Mechanism and application in knee strap design in Walking and Running (P0043476, 1-CD5N)". HK$300,000, 2022/11/01-2024/10/31 (PI: WANG Yan; Co-I: TENG Long, TAN Qitao, **MA Zonghao**).
20. **Research Institute for Smart Ageing (RISA), The Hong Kong Polytechnic University**. "Smart Technologies for Assessing and Enhancing Older Adults' Mobility (Ref: P0043002, 1-CD4Y)". HK$1,000,000, 2022/09/01-2024/08/31 (PI: WEN Chunyi; Co-I: **MA Zonghao**).
21. **Research Institute for Smart Ageing (RISA), The Hong Kong Polytechnic University**. "Ultrasound Imaging Powered by AI and Robotics for Ageing-Related Neuromusculoskeletal Diseases (Ref: P0043005, 1-CD5B)". HK$1,000,000, 2022/09/01-2025/08/31 (PI: ZHENG Yongping; Co-I: **MA Zonghao**).
22. **Large Equipment Fund for Teaching, Internal Research Fund: Areas of Excellence Committee, The Hong Kong Polytechnic University**. "Gait Evaluation and Training using Plantar Pressure Measuring Treadmill (BME-1) (Ref: P0036787, LEF2021-030)". HK$994,900, 2021/06/15-2022/06/30 (PI: ZHANG Ming; Co-I: YICK Kit Lun, WONG Wai Chi, WANG Yan, **MA Zonghao**, LUXIMON Yan, KOBAYASHI Toshiki).

# Publications

(Total ≥ **65**: journal publication: **30**; patent: **1**; guideline: **1**; book:**1**; book chapters: **3**; conference publication: **31**)

Note: Web of Science JCR Impact Factor & Quartile, #Equal contribution, *****Corresponding author, Underlined author indicates student / staff / postdoc fellow trained by Dr. Ma as Chief Supervisor.

## Edited Book

1. **Ma CZH**, Li Z, He C. (2023). *Biomechanics-Based Motion Analysis* (1st ed., pages: 1-386). ISBN 978-3-0365-8027-2 (hardback); ISBN 978-3-0365-8026-5 (PDF). DOI: https://doi.org/10.3390/books978-3-0365-8026-5. MDPI AG, Switzerland.

## Guideline

1. **Ma Z.** (2020). Suggestions for Prosthetic Orthotic Clinics that Must Remain Open During the COVID-19 Pandemic - Working Document (Chinese version). International Society for Prosthetics and Orthotics. Translated by Ma Z.-H., pp. 1-10, April 2020. Weblink: https://drive.google.com/file/d/1zCGGTkDporqqb0wkGa1BotWq7gPRlpCA/view.《对在 COVID-19 病毒大流行时仍必须保持开放的假肢与矫形诊所的建议-工作文件(中文版)》 译者: 马宗浩. 国际假肢与矫形协会.

## Patent

1. **Ma ZH**, Zheng YP, Huang ZH. (2022). A balance and gait training method, system, and device. Chinese Patent (Ref: CN 109147904 B; Application date: 30 August 2018; Licensed date: 3 May 2022). 一种平衡和步态的训练方法、系统及终端; 发明人: 马宗浩, 郑永平, 黄子豪;专利号:

ZL201811005548.X；公开号: 109147904A；申请日: 2018-08-30; 公开日: 2019-01-04；授权日: 2022-05-03.

## Journal Publications (Total: **30**; 1st/corresponding author: **19**)

### 1. Mechanism of human posture and motion control

1. Tong CY, Zhu TL, Ling YT, Scheeren EM, Lam FMH, Fu H*, **Ma CZH* (co-corresponding author)**. Muscular and kinematic responses to unexpected translational balance perturbation in healthy young adults. *Bioengineering*. 2023, 10(7), 831; DOI: https://doi.org/10.3390/bioengineering10070831. (**Q2**, 2022 JCR IF=4.6, Rank 34/96 in Engineering, Biomedical).
2. Zheng Q, Xie L*, Xu J, Xia N, **Ma CZH**. A feasibility study of applying two-dimensional photogrammetry for screening and monitoring of patients with adolescent idiopathic scoliosis in clinical practice. *Scientific Reports,* 2023, 13, 14273; DOI: https://doi.org/10.1038/s41598-023-41267-2. (**Q2**, 2022 JCR IF=4.6, Rank 22/73 in Multidisciplinary Sciences).
3. Zhu RTL, Lyu PZ, Li S, Tong CY, Ling YT, **Ma CZH* (corresponding author)**. How Does Lower Limb Respond to Unexpected Balance Perturbations? New Insights from Synchronized Human Kinetics, Kinematics, Muscle Electromyography (EMG) and Mechanomyography (MMG) Data. *Biosensors*. 2022, 12(6), 430; DOI: https://doi.org/10.3390/bios12060430. (**Q1**, 2022 JCR IF=5.4, Rank 11/63 in Instruments & Instrumentation,14/86 in Chemistry, Analytical).
4. Lyu PZ[#], Zhu TLR[#], Ling YT, Wang LK, Zheng YP, **Ma CZH* (corresponding author)**. How Paretic and Non-Paretic Ankle Muscles Contract during Walking in Stroke Survivors: New Insight Using Novel Wearable Ultrasound Imaging and Sensing Technology. *Biosensors.* 2022, 12(5), 349; DOI: https://doi.org/10.3390/bios12050349 (**Q1**, 2022 JCR IF=5.4, Rank 11/63 in Instruments & Instrumentation,14/86 in Chemistry, Analytical).
5. Liu W, Wu HD, Ling YT, Shea QTK, Nazari V, Zheng YP, **Ma CZH* (corresponding author)**. Reliability and validity of assessing lower-limb muscle architecture of patients with cerebral palsy (CP) using ultrasound: a systematic review. *Journal of Clinical Ultrasound*. 2023, 51(7), 1212-1222; DOI: https://doi.org/10.1002/jcu.23498. (Q4, 2022 JCR IF=0.9, Rank 27/31 in Acoustics; 130/135 in Radiology, Nuclear Medicine & Medical Imaging).
6. **Ma CZH* (corresponding author)**, Li Z, He C. Advances in Biomechanics-Based Motion Analysis. *Bioengineering*. 2023, 10(6), 677; DOI: https://doi.org/10.3390/bioengineering10060677. (**Q2**, 2022 JCR IF=4.6, Rank 34/96 in Engineering, Biomedical).
7. Zheng Q, Huang Y*, He C, Xu T, Jie Y, **Ma CZH* (co-corresponding author)**. Can Computer-Aided Design and Computer-Aided Manufacturing Integrating with/without Biomechanical Simulation Improve the Effectiveness of Spinal Braces on Adolescent Idiopathic Scoliosis? *Children*. 2023, 10(6), 927; DOI: https://doi.org/10.3390/children10060927. (**Q2**, 2022 JCR IF=2.4, Rank 58/130 in Pediatrics).
8. Ren LJ, Cheng LK, **Ma CZH.**, Zheng YP*. Changes in Muscle Hardness from Resting to Mid-Range Lengthened Positions Detected by Shear Wave Elastography (SWE) with A Novel Protocol of Ultrasound Probe Placement. *Applied Sciences*. 2021, 11(1), 452; DOI: 10.3390/app11010452. (**Q2**, 2022 JCR IF=2.7, Rank 42/90 Engineering, Multidisciplinary).
9. **Ma CZH[#] (co-first author)**, Ren LJ[#], Cheng LK, Zheng YP*. Mapping of back muscle stiffness along spine during standing and lying in young adults: A pilot study on spinal stiffness quantification with ultrasound imaging. *Sensors*. 2020, 20(24), 7317; DOI: 10.3390/s20247317. (**Q2**, 2022 JCR IF=3.9, Rank 19/63 in Instruments & Instrumentation).

10. Ling, YT, **Ma CZH**, Shea TK, Zheng YP*. Sonomechanomyography (SMMG): Mapping of skeletal muscle motion onset during contraction using ultra-fast ultrasound imaging and multiple motion sensors. *Sensors.* 2020, 20(19): E5513. DOI: 10.3390/s20195513. (**Q2**, 2022 JCR IF=3.9, Rank 19/63 in Instruments & Instrumentation).
11. **Ma CZH**, Ling YT, Shea TK, Wang LK, Zheng YP*. Towards wearable comprehensive capture and analysis of skeletal muscle activity during human locomotion*. Sensors*. 2019, 19(1), 195; DOI: 10.3390/s19010195. (**Q2**, 2022 JCR IF=3.9, Rank 19/63 in Instruments & Instrumentation).
12. Elhadi MMO, **Ma CZH**, Wong DWC, Wan AHP, Lee WCC*. Comprehensive gait analysis of healthy older adults who have undergone long-distance walking. *Journal of Aging and Physical Activity*. 2017, 25:367-377; DOI: 10.1123/japa.2016-0136. (Q3, 2022 JCR IF=1.5, Rank 30/37 in Gerontology).

## 2. Artificial intelligence (AI) in human motion capture and analysis

13. Wang H[#], Gao C[#], Fu H*, **Ma CZH* (co-corresponding author)**, Wang Q, He Z, Li M. Automated Student Classroom Behaviors' Perception and Identification Using Motion Sensors. *Bioengineering.* 2023, 10(2), 127; DOI: https://doi.org/10.3390/bioengineering10020127. (**Q2**, 2022 JCR IF=4.6, Rank 34/96 in Engineering, Biomedical).

## 3. Balance improvement & Fall prevention

14. **Ma CZH**, Bao T, DiCesare C, Harris I, Chambers A, Shull P*, Zheng YP, Cham R, Sienko KH*. Reducing slip risk: A feasibility study of gait training with semi- real-time biofeedback of foot-floor contact angle*. Sensors.* 2022, 22(10), 3641; DOI: https://doi.org/10.3390/s22103641. (**Q2**, 2022 JCR IF=3.9, Rank 19/63 in Instruments & Instrumentation).
15. **Ma CZH**, Lam WK, Chang BC, and Lee WCC*. Can insoles be used to improve static and dynamic balance of community-dwelling older adults? A systematic review on recent advances and future perspectives. *Journal of Aging and Physical Activity.* 2020, 28(6):971-986; doi:10.1123/japa.2019-0293. (Q3, 2022 JCR IF=1.5, Rank 30/37 in Gerontology).
16. **Ma CZH* (corresponding author)**, Chung AKL, Ling YT, Huang ZH, Cheng LK., Zheng YP. A newly-developed smart insole system with instant reminder: paves the way towards integrating artificial intelligence (AI) technology to improve balance and prevent falls. *Age and Ageing*. 2019, 48(Supplement_4), iv28-iv33; DOI: 10.1093/ageing/afz164.121. (**Q1**, 2022 JCR IF=6.7, Rank 10/54 in Geriatrics & Gerontology).
17. **Ma CZH**, Zheng YP, Lee WCC*. Changes in gait and plantar foot loading upon using vibrotactile wearable biofeedback system in patients with stroke. *Topics in Stroke Rehabilitation.* 2018, 25(1):20-27; DOI: 10.1080/10749357.2017.1380339. (**Q2**, 2022 JCR IF=2.2, Rank 26/68 in Rehabilitation).
18. **Ma CZH**, Wong DWC, Wan AHP, Lee WCC*. Effects of orthopaedic insoles on static balance of older adults wearing thick socks. *Prosthetics and Orthotics International*. 2018, 42(3):357-362; DOI: 10.1177/0309364617752982. (Q3, 2022 JCR IF=1.5, Rank 63/86 in Orthopedics).
19. **Ma CZH**, Lee WCC*. A wearable vibrotactile biofeedback system improves balance control of healthy young adults following perturbations from quiet stance. *Human Movement Science*. 2017, 55: 54-60; DOI: 10.1016/j.humov.2017.07.006. (Q3, 2022 JCR IF=2.1, Rank 54/87 in Sport Sciences).
20. **Ma CZH**, Wong DWC, Lam WK, Wan AHP, Lee WCC*. Balance improvement effects of biofeedback systems with state-of-the-art wearable sensors: a systematic review. *Sensors.* 2016, 16 (4), 434; DOI: 10.3390/s16040434. (**Q2**, 2022 JCR IF=3.9, Rank 19/63 in Instruments & Instrumentation).
21. Wan AHP[#], Wong DWC[#], **Ma CZH**, Zhang M, Lee WCC*. Wearable vibrotactile biofeedback device allowing identification of different floor conditions for lower-limb amputees. *Archives of Physical*

*Medicine and Rehabilitation*. 2016, 97(7):1210-1213; DOI:10.1016/j.apmr.2015.12.016. (**Q1**, 2022 JCR IF=4.3, Rank 8/68 in Rehabilitation).

22. **Ma CZH**, Wan AHP, Wong DWC, Lee WCC*, Zheng YP. A vibrotactile and plantar force measurement-based biofeedback system: Paving the way towards wearable balance-improving devices. *Sensors*. 2015, 15, 31709–31722; DOI: 10.3390/s151229883. (**Q2**, 2022 JCR IF=3.9, Rank 19/63 in Instruments & Instrumentation).

## 4. Active health & Promotion of physical activity

23. Li Y, Wong A, Chung M, Li M[#], Molasiotis A, Bressington D, **Ma CZH**, Kor P, Yeung WF. Evaluation of a Physical-Psychological Integrative (PPI) intervention for community-dwelling spinal cord injury survivors: study protocol of a preliminary randomized controlled trial. *PLoS One.* 2023, 18(3), e0282846; DOI: 10.1371/journal.pone.0282846. (**Q2**, 2022 JCR IF=3.7, Rank 26/73 in Multidisciplinary Sciences).
24. Huang ZH[#], **Ma CZH[#] (co-first author)**, Wang LK, Wang XY, Fu SN, Zheng YP*. Real-time Visual Biofeedback via Wearable Ultrasound Imaging Can Enhance Muscle Contraction Training Outcome of Young Adults*. Journal of Strength and Conditioning Research*. 2022, 36(4), 941-947; DOI: 10.1519/JSC.0000000000004230. (**Q2**, 2022 JCR IF=3.2, Rank 28/87 in Sport Sciences).
25. He C, Yang JT*, Zheng Q, Mei Z, **Ma CZH**. How do Paraspinal Muscles Contract during the Schroth Exercise Treatment in Patients with Adolescent Idiopathic Scoliosis (AIS)? *Bioengineering*. 2022, 9(6), 234; DOI: https://doi.org/10.3390/bioengineering9060234. (**Q2**, 2022 JCR IF=4.6, Rank 34/96 in Engineering, Biomedical).
26. Wang L, Xia N, Wang C, Zheng Q, **Ma CZH**, Youssef AS, Zhang C, Deng Y, Zhu G and Huang X*. Optimized scheme for paired transverse corrective forces in S-shaped scoliosis via ultrasound and application in Chêneau brace: a pilot study. *Prosthetics and Orthotics International*. 2022. 46(1), 42-49; DOI: 10.1097/PXR.0000000000000064. (Q3, 2022 JCR IF=1.5, Rank 63/86 in Orthopedics).
27. Ren LJ, Wang LK, **Ma CZH**, Yang YX*, Zheng YP*. Effect of conventional physiotherapy on pain and muscle stiffness in patients with low back pain assessed by a wireless hand-held tissue ultrasound palpation system (TUPS)*. International Journal of Physical Medicine & Rehabilitation*. 2019, 7(2):1-5; DOI: 10.4172/2329-9096.1000512.
28. Elhadi MMO[#], **Ma CZH[#] (co-first author)**, Lam WK, Lee WCC*. Biomechanical approach in facilitating long-distance walking of elderly people using footwear modifications. *Gait & Posture*. 2018, 64: 101-107; DOI: 10.1016/j.gaitpost.2018.05.032. (**Q2**, 2022 JCR IF=2.4, Rank 40/86 in Orthopedics).
29. Lam WK*, Lee WCC, Lee WM, **Ma CZH**, Kong PW. Segmented forefoot plate in basketball footwear – Does it influence performance and foot joint kinematics and kinetics? *Journal of Applied Biomechanics*. 2018, 34(1):31-38; DOI: 10.1123/jab.2017-0044. (Q4, 2022 JCR IF=1.4, Rank 75/87 in Sport Sciences).
30. Wang Q, Lei ZJ, **Ma Z**, Shuai T, Wong MS*. Application of Medical Imaging Technologies in Adolescent Idiopathic Scoliosis (review). *Chinese Journal of Rehabilitation Theory and Practice*. 2017 , 23(11), 1304-130 7; DOI: 0.3969/j.issn.1006-9771.2017.11.013. 王谦, 雷中杰, **马宗浩**, 帅桃, & 黄文生. (2017). 青少年特发性脊柱侧凸影像学评估研究进展. *中国康复理论与实践*, 23(11), 1304-1307.

## Book Chapters

1. **Ma CZH.** Clinical practice of foot orthoses. In: *Principle of Prosthetics and Orthotics Practice*. Edited by Wu J, pp 170-186, People's Medical Publishing House Co., LTD, ISBN 978-7-117-29917-6. 马宗浩 (2020 年 12 月). 足部矫形器的制作与应用.《假肢矫形实践指导》. 卢山 主编, 人民卫生出版社.
2. **Ma CZH**. Clinical practice of knee orthoses. In: *Principle of Prosthetics and Orthotics Practice*. Edited by Wu J, pp 197-209, People's Medical Publishing House Co., LTD, ISBN 978-7-117-29917-6. 马宗浩 (2020 年 12 月). 膝矫形器的制作与应用.《假肢矫形实践指导》. 卢山 主编, 人民卫生出版社.
3. **Ma CZH** & Lee WCC. (2018). Falls in the elderly and improving postural stability by biofeedback system. In: Bioengineering and Biomechanics Book Series – *Biomechanics in Rehabilitation Engineering*. Edited by Fan Y and Zhang M, pp 147-165, Shanghai Jiao Tong University Press, ISBN 978-7-313-1799-37. 马宗浩、李超俊 (2018). 第八章 - 关于老年人跌倒机制与平衡功能提升的研究进展.《康复工程生物力学 生物力学研究前沿系列》 樊瑜波 张明 主编, pp 147-165, 上海交通大学出版社, ISBN 978-7-313-1799-37.

## Conference Publications/Presentations (Total: **31**)

1. Luo YY, Zhou YJ, **Ma CZH***. Exploring Muscle Activity in Older Fallers and Non-fallers with Wearable Ultrasound Imaging. *2023 Joint Conference of the Australia and New Zealand Falls Prevention Society & World Falls Congress*, 26-28 November 2023, Perth, Western Australia. (Oral).
2. Zhu TLR, **Ma CZH***. Fallers use more lower-limb muscle activation and power to maintain reactive balance. *2023 Joint Conference of the Australia and New Zealand Falls Prevention Society & World Falls Congress*, 26-28 November 2023, Perth, Western Australia. (Oral).
3. Li KJ, **Ma CZH***. Fall Risk Identification in Community-dwelling Older People Using Inertial Measurement Unit (IMU). *2023 Joint Conference of the Australia and New Zealand Falls Prevention Society & World Falls Congress*, 26-28 November 2023, Perth, Western Australia. (Oral).
4. Li JZ, **Ma CZH***. Fall prediction of older people using wearable devices and AI technology. *2023 Joint Conference of the Australia and New Zealand Falls Prevention Society & World Falls Congress*, 26-28 November 2023, Perth, Western Australia. (Poster).
5. Zhu TLR, **Ma CZH***. Exploring postural balance control in community-dwelling older adults with high fall risks: biomechanical and electromyographic (EMG) analyses. *The 23rd National Conference of Chinese Medical Association - Chinese Society of Physical Medicine and Rehabilitation* 中华医学会第二十三次全国物理医学与康复学学术会议, 7-10 September 2023, Shanghai, China. (Oral).
6. Liu W, Wu HD, Ling YT, Shea QTK, **Ma CZH***. Reliability and validity of assessing lower limb muscle architecture of patients with cerebral palsy using ultrasound: a systematic review. *ISPO 19th World Congress*, 24-27 April 2023, Guadalajara, Mexico. (Oral).
7. Li KJ, Chung AKL, Lam MWY, **Ma CZH***. Utilizing novel smart wearable assistive technology to facilitate sensorimotor training of stroke survivors: Towards home/community-based rehabilitation. *ISPO 19th World Congress*, 24-27 April 2023, Guadalajara, Mexico. (Oral).
8. Li Y, Li M*, Wong A, Molasiotis A, Bressington D, **Ma CZH**, Kor P, Yeung J. Evaluation of a Physical-Psychological Integrative (PPI) intervention for Community-Dwelling Spinal Cord Injury Survivors: Study Protocol of a Randomized Controlled Trial. *26th East Asian Forum of Nursing Scholars (EAFONS) conference*, 10-11 March 2023, Japan. (Oral).

9. Tong CYC, Zhu TL, Lyu PZ, **Ma CZH***. Lower-Limb Muscle Activities When Maintaining Static Balance. *7th Singapore Rehabilitation Conference & 7th Asian Prosthetics and Orthotics Scientific Meeting (SRC – APOSM 2022)*, 8-9 October 2022., Singapore. (Oral). **(Best Abstract Award (Group) - Prosthetics and Orthotics Outstanding Capstone Project Award)**
10. Zhu TL, Lyu PZ, Li S, Tong CYC, **Ma CZH***. How eight major leg muscles respond to unexpected perturbations and maintain standing balance in healthy young adults? *IUPESM World Congress on Medical Physics & Biomedical Engineering 2022*, 12-17 June 2022, Singapore. (Oral).
11. **Ma CZH***, Chung AKL, Ling YT, Huang ZH, Cheng LK, Zheng YP. Advanced smart insole system to improve outcome of balance training and walking ability. *ISG's 12th World Conference of Gerontechnology* (International Society for Gerontechnology), 18-20 May 2020, Trondheim, Norway. (Oral).
12. **Ma CZH***, Chung AKL, Ling YT, Huang Z, Cheng LK, Zheng YP. A newly-developed smart insole system with instant reminder: Paves the way towards integrating artificial intelligence (AI) technology to improve balance and prevent falls. *1st World Congress on Falls and Postural Stability 2019 (WCFPS 2019)*, 04-07 December 2019, Kuala Lumpur, Malaysia. (Poster).
13. **Ma CZH***, Chung AKL, Ling YT, Huang Z, Cheng LK, Zheng YP. Smart insole and smartwatch system with big data analytics to improve balance training. ISPO's 17th World Congress (International Society for Prosthetics and Orthotics), 5-8 October 2019, Kobe, Japan. (Oral). **(Travel Grant)**
14. **Ma CZH**, Ling YT, Shea QTK, Wang LK, Wang XY, Zheng YP*. Towards comprehensive understanding of leg muscle activity in gait by a novel wearable system with ultrasound imaging and multiple sensing. *ISPO's 17th World Congress* (International Society for Prosthetics and Orthotics), 5-8 October 2019, Kobe, Japan. (Oral).
15. **Ma CZH**, Bao T, Le V, Chambers A, Shull P, Zheng YP, Cham R, Sienko KH*. A feasibility study for gait training with foot-floor contact angle feedback*. International Society of Posture and Gait Research (ISPGR) World Congress,*2019, 30 June-4 July, Edinburgh, Scotland. (Poster).
16. **Ma CZH.**, Chung AKL., Ling YT, Huang Z, Cheng LK, Zheng YP*. Advanced smart insole system to improve outcomes of balance training and walking ability. *11th International Association of Gerontology and Geriatrics (IAGG) Asia/Oceania Regional Congress 2019*, 23-27 October 2019, Taipei. (Oral)
17. Ling YT*, **Ma CZH**, Shea QTK., Zheng YP. Spatial differentiation of muscle contraction onset using sono-mechano-myo-graphy (SMMG). *The 9th WACBE World Congress on Bioengineering 2019* (World Association for Chinese Biomedical Engineers), August 16-19, 2019, Taipei.
18. **Ma CZH.**, Lee WCC., Zheng YP*. Smart insole with instant vibrotactile biofeedback of plantar force improve gait of patients with stroke. *Asian Prosthetic and Orthotic Scientific Meeting (APOSM)* 2018, 7-9 November 2018, Bangkok, Thailand. (Oral). **(Travel Grant)**
19. **Ma CZH**, Zheng YP, Lee WCC*. Vibrotactile wearable biofeedback system integrated with force sensors at plantar foot could relieve foot varus deformity in patients with stroke. *ISPO's 16th World* Congress (International Society for Prosthetics and Orthotics), 8-11 May 2017, Cape Town, South Africa. (Oral). **(Travel Grant)**
20. **Ma CZH***, Ling YT, Lee WCC, Zheng YP. A wearable plantar-force based vibrotactile biofeedback system improving balance of patients with stroke during walking. *The 8th WACBE World Congress on Bioengineering 2017* (World Association for Chinese Biomedical Engineers), 30 July- 2 August 2017, Hong Kong SAR. (Oral).
21. **Ma CZH**, Zheng YP, Lee WCC*. Smart wearable vibrotactile biofeedback systems could enhance balance and gait control in older adults and patients with stroke. *The 11th Beijing International Forum on Rehabilitation*, 2-4 December 2016, Beijing, China. (Oral).

22. **Ma CZH**, Lee WCC, Zheng YP*. Foot orthosis could improve elderly balance and gait control by changing plantar mechanical stimulations. *Asian Prosthetic and Orthotic Scientific Meeting (APOSM) 2016*, 4-6 November 2016, Seoul, Korea. (Poster).
23. **Ma CZH**, Wong DWC, Wan AHP, Elhadi MMO, Lee WCC*. Different arch supports and metatarsal pads of orthopaedic insoles induce different effects on postural balance. *The 10th Beijing International Forum on Rehabilitation*, 11-13 September 2015, Beijing, China. (Oral). **(Outstanding Paper Award)**
24. **Ma CZH***. Falls in elderly. *The 10th Beijing International Forum on Rehabilitation*, 11-13 September 2015, Beijing, China.
25. **Ma CZ**, Wan AHP, Wong DWC, Zheng YP, Lee WCC*. Insoles and plantar-force based vibrotactile biofeedback system improve elderly standing balance. *2015 Symposium on Biomedical and Rehabilitation Engineering*, 15 May 2015, Hong Kong SAR. (Poster).
26. Elhadi MMO, **Ma CZH**, Wong DWC, Wan AHP, Lee WCC*. Gait changes after long distance walking among healthy elderly people with different walking abilities. *The 10th Beijing International Forum on Rehabilitation*, 11-13 September 2015, Beijing, China.
27. Wan AHP, Wong DWC, **Ma CZH**, Zhang M, Lee WCC*. A new wearable haptic biofeedback device contributes to more successful floor identification in lower-limb amputees. *The 10th Beijing International Forum on Rehabilitation*, 11-13 September 2015, Beijing, China.
28. **Ma CZH**, Wan AHP, Wong DWC, Zheng YP, Lee WCC*. Improving postural control using a portable plantar pressure-based vibrotactile biofeedback system. *2014 IEEE Conference on Biomedical Engineering and Sciences*, 8-10 December 2014, Miri, Sarawak, Malaysia. Conference full paper, 2014: 855-860. DOI: 10.1109/IECBES.2014.7047632. (Oral).
29. **Ma CZH**, Wan AHP, Wong DWC., Zheng YP, Lee WCC*. Technologies for enhancing elderly balance. *BME 2014 Biomedical Engineering International Conference*, 4-6 December 2014, Hong Kong SAR. PP A-1. (Oral).
30. **Ma Z***. Tissue's response to mechanical environment and pressure: pressure ulcers. *The 8th Beijing International Forum on Rehabilitation*. Conference full paper, 2013.
31. **Ma Z**, Hu Z*. Design and clinical application of elastic orthosis and its effect on patients with cerebral palsy. *The 7th Beijing International Forum on Rehabilitation*. Conference full paper, 2012: 893-897.

## Dissertation

- **Ma CZH.** (2018). *Improving balance and gait using biomechanical and electronic approaches*. Doctoral dissertation. The Hong Kong Polytechnic University.

## Invited Conference Talk

1. "Smart active approaches to evaluate and prevent falls of community-dwelling older people", **Healthy Ageing Conference 2023**, **World Health Organization (WHO) Collaborating Centre (WHO CC) for Community Health Services**, 26-27 October 2023, Hong Kong SAR.
2. "Smart wearable system to improve balance and prevent falls", **Prosthetic and Orthotic Scientific Meeting 2023**, **International Society for Prosthetics and Orthotics - Hong Kong Society** and **Hong Kong Society of Certified Prosthetist-Orthotists**, 16 September 2023, Hong Kong SAR.
3. "Smart Insole System to Improve Balance and Prevent Falls 提升平衡预防跌倒的智能鞋垫系统", **The 3rd Asia-Pacific International Rehabilitation Forum 2023 第 3 届亚太国际康复论坛**, 3-6 August 2023, Shenzhen, China.

4. “Prevention and treatment of Idiopathic scoliosis in adolescents in Europe, America, and Hong Kong 欧美与香港地区青少年特发性脊柱侧弯的防控与防治措施”, **2023 “Henan-Hong Kong” Scoliosis and Sports Rehabilitation Public Welfare Academic Forum (Seventh Phase) 2023 豫港脊柱侧弯与运动康复公益学术论坛（第七期）**, 10-11 June 2023, Zhengzhou, China.
5. “Smart Wearable System with Real-Time Feedback to Improve Human Balance and Walking Ability”, "Assistive Robotic Systems for Human Balancing and Walking: Emerging Trends and Perspectives", **2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022)**, 23-27 October 2022, Kyoto, Japan.
6. “Smart Insole System to Improve Balance and Prevent Falls”, **The Second Annual Conference of Rehabilitation Assistive Devices Committee of Chinese Association of Rehabilitation Medicine** 中国康复医学会康复辅具应用专业委员会, 20-21 August 2022, Dalian China.
7. “Biomechanical relationship between scoliosis and vertebral wedge deformation 脊柱侧弯与锥体楔形形变的生物力学关系”, **2022 “Henan-Hong Kong” Scoliosis and Sports Rehabilitation Public Welfare Academic Forum (First Phase) 2022 豫港脊柱侧弯与运动康复公益学术论坛（第一期）**, 6 May 2022, Zhengzhou, China.
8. “Scoliosis and Biomechanics of Human”, **The 2nd Annual Conference of Henan Society for Management and Sport Rehabilitation of Ankle-Foot and Spinal Disorders**, 16-17 October 2021, Zhengzhou, China.
9. “iBalanx - Smart Insole for Fall Detection & Prevention”, **Gerontechnology Platform - Theme Based Workshop: Fall Detection & Presentation, The Hong Kong Council of Social Service (HKCSS)**, 26 July 2021, Hong Kong SAR.
10. “Effect and Rehabilitation Engineering Management of Ankle-Foot Deformity on Postural Balance”, **The 1st Annual Conference of Henan Society for Management and Sport Rehabilitation of Ankle-Foot and Spinal Disorders**, 19-20 December 2020, Zhengzhou, China.
11. “Biofeedback in Orthotics: Research and Application”, **Joint Annual Conference of Swedish Board of Prosthetic and Orthotic Agents (Ortopedtekniska Branschrådet, OTB) and Swedish Prosthetics and Orthotics Association (Sveriges Ortopedingenjörers Förening, SOIF)**, 5-6 November 2019, Jönköping, Sweden.

## Invited Research Seminar / Salon

1. “Design and application of ankle-foot orthosis in patients with stroke”, **Yunnan University**, 18-22 August 2022, Kunming, China.
2. “Smart Technologies for Assessing and Enhancing Older Adults’ Mobility”, **Research Institute for Smart Ageing (RISA), The Hong Kong Polytechnic University**, 4 May 2022, Hong Kong SAR.
3. “Smart Insole System to Improve Balance and Prevent Falls”, **Research Institute for Intelligent Wearable Systems (RI-IWEAR), The Hong Kong Polytechnic University**, 19 April 2022, Hong Kong SAR.
4. “Ultrasound Imaging for Ageing Related Diseases”, **Research Institute for Smart Ageing (RISA), The Hong Kong Polytechnic University**, 9 April 2022, Hong Kong SAR.

5. “Smart Wearable Technology for Motion Analysis & Improvement: Research and Application”, **Department of Computer Science, Chu Hai College of Higher Education**, 14 May 2020, Hong Kong SAR.

## Exhibition

1. “A smart wearable lower-limb sensorimotor training system”, website: https://gies.hk/en/expo/exhibition-products/detail/1369, **Gerontech and Innovation Expo cum Summit (GIES)**, 2-5 November 2022, Hong Kong SAR.
2. “iBalanx: AI-based smart insole with instant reminder to improve balance and prevent falls”, website: https://gies.hk/en/expo/exhibition-products/detail/1369, **Gerontech and Innovation Expo cum Summit (GIES)**, 3-6 November 2021, Hong Kong SAR.

## Mentoring Experience

### Chief Supervisor of research postgraduate students (PhD / MPhil)

1. LUO Yuyan Laura, **PhD**. *Robot-assisted spinal stretching strategy for patients with adolescent idiopathic scoliosis (AIS)*. (Enrolled on 4 September 2023, ongoing, PolyU).
2. LIU Wei, **PhD**. *Study of lower-limb muscle activity of patients with spastic cerebral palsy pre- and post-treatment: Towards evidence-based treatment protocol*. (Enrolled on 10 January 2022, ongoing, PolyU).
3. LI Kejing, **PhD**. *Investigating effect of sensorimotor and gait training on lower-limb proprioception and motor function of stroke survivors*. (Enrolled on 30 August 2021 as MPhil, transferred to PhD and study registration confirmed on 23 December 2022, ongoing, PolyU).
4. ZHU Tanglong Ringo, **PhD**. *Exploring mechanism of falls and fall-prevention strategies in older fallers and older non-fallers with neuromuscular, sonographic and biomechanical analysis*. (Enrolled on 7 September 2020 as MPhil, transferred to PhD and study registration confirmed on 21 July 2021, ongoing, PolyU).

### Chief Supervisor of taught postgraduate students (MSc)

5. LI Junzhe, **MSc**. *Identifying biomechanical and physiological parameters for fall prevention in the older people with wearable devices and artificial intelligence*. (Ongoing, PolyU).
6. HUNG Tim Mei, **MSc**. *The kinematic and muscular response of older fallers and older non-fallers under translational balance perturbation*. (**UGC Targeted Taught Postgraduate Programmes Fellowships Scheme**, University Grants Committee, Hong Kong Special Administrative Region Government; Ongoing, PolyU).

### Chief Supervisor of undergraduate students with theses (BSc)

7. NG Pak San, **BSc**. *In muscle morphology comparison between walking with and without ankle-foot-orthosis in stroke patients*. (Ongoing, PolyU).

8. LAM Wing Yang Michael, **BSc**. *Investigating Mechanism of Falls in Older Individuals from Muscle Activity Perspective by An Innovative Wearable Ultrasound Imaging System: A Pilot Study*. (Ongoing, PolyU).
9. WONG Lok Yi Nicky, **BSc**. *A Reliability and Validity Study of using Waist-attached Inertial Measurement Unit (IMU) to Evaluate the Falling Risk of Older People*. (Ongoing, PolyU).
10. WONG Hok Man Leon, **BSc**. *Proactive Companion Robot*. (**Champion of Best Project Award, FENG Inter-departmental Final Year Project 2021-22**, Faculty of Engineering, PolyU; Awarded July 2022, PolyU).
11. TONG Cheuk Ying Charmaine, **BSc**. *Lower-Limb Muscle Activities When Maintaining Static Balance in Young and Old adults*. (**Service-Learning Scholarship - FYP / Capstone Project**, Service-Learning and Leadership Office, PolyU; Awarded July 2022, PolyU).
12. SEISEKHANOV Dias, **BSc**. Portable ultrasound imaging device for investigation of the skeletal muscle activity of patients with stroke. (Awarded November 2021, PolyU).
13. THUNBERG Vilma, **BSc**. *In vivo* muscle morphology comparison between walking with and without ankle-foot orthosis. (Awarded June 2020, Jönköping University).
14. JANSSON Anna, **BSc**. *In vivo* muscle morphology comparison between walking with and without ankle-foot orthosis. (Awarded June 2020, Jönköping University).
15. KARLSSON Sofi, **BSc**. Development and preliminary validation of a new brace appearance questionnaire. (Awarded June 2019, Jönköping University).
16. THÓRARINSDÓTTIR Thórkatla Dagný, **BSc**. Development and preliminary validation of a new brace appearance questionnaire. (Awarded June 2019, Jönköping University).
17. HERMANSSON Erik, **BSc**. A material study of insoles manufactured using different methods. (Awarded June 2019, Jönköping University).
18. EKBERG Marcus, **BSc**. A material study of insoles manufactured using different methods. (Awarded June 2019, Jönköping University).

## Co-supervision of research postgraduate students (PhD / MPhil)

19. YAN Jin, **MPhil**. Wearable sensing of temperature and muscle activation in patients with knee osteoarthritis. (Enrolled on 29 August 2022, PolyU).

# Service

## Internal Service

### Departmental Service

- Coordinator, Engineering Doctorate (EngD) Programme, PolyU BME (Since September 2023).
- Member (representing Assistant Professors), Departmental Research Committee (DRC), PolyU BME (Since September 2023).
- Member, Departmental Health, Safety and Environment Committee (DHSEC), PolyU BME (Since September 2023).
- Duty function of supporting oversea P&O service trip: To support PolyU BME students and alumni to provide community services to the children with cerebral palsy, Guangdong Work Injury Rehabilitation Hospital, Guangzhou, China , PolyU BME (2023/05/15-2023/05/24).

- Working Group Member, Henan – Hong Kong Joint Research Center for Diagnosis and Physical Rehabilitation of Scoliosis 豫港脊柱侧弯诊疗与运动康复联合研究中心, PolyU BME (2023/01/01-2027/12/31).
- Contact Person, Promotion of MSc program in Rehabilitation Engineering in mainland China, PolyU BME (since 2021).
- Interview Panel Member, candidates of Project Associate/Assistant of Jockey Club Smart Ageing Hub, PolyU BME (since February 2022).
- Interview Panel Member, candidates of Senior Scientific Officer / Scientific Officer of Jockey Club Smart Ageing Hub, PolyU BME (since August 2021).
- Interview Panel Member, candidates of BSc program in Biomedical Engineering from Mainland China, PolyU BME (since 2021).
- Interview Panel Member, candidates of MSc program in Biomedical Engineering, PolyU BME (since 2021).
- Contact Person, Prosthetic and Orthotic (P&O) program between Jönköping University and PolyU, Jönköping University (2019-2020).

### Faculty Service

- Memember, Faculty Engineering Doctorate (EngD) Programme Committee, PolyU FENG (Since September 2023).
- Working Group Member, Development of Ageing Data Registry System (ADRES), Research Institute of Smart Ageing (RISA), PolyU (since April 2022).
- Member, Research Institute for Sports Science and Technology (RISports), PolyU (since 2022).
- Member, EngD Student/ Staff Consultative Group (SSCG) meeting, Faculty of Engineering (FENG), PolyU (since 2022).
- Member, Research Institute for Smart Ageing (RISA), PolyU (since 2021).

### University Service

- Hearing Committee Member, Student Resources and Support Section, Student Affairs Office (SAO), PolyU (since December 2021).
- Residential Fellow, College of Undergraduate Researchers and Innovators (CURI) Residential College (CURI RC), PolyU (August 2021 - August 2022).

## Editors / Reviewers

### Reviewer of Research Grant / Fellowships / Scholarships

- Doctoral Fellowship Programme, Austrian Academy of Sciences (since 2019).

### Editorship of Journals

- Guest Associate Editor in Movement Disorders, *Frontiers in Neurology* (since 2022).

### Guest Editor of Journal Special Issues

- *BMC Musculoskeletal Disorders – "Prosthetics and Orthotics"* (**Q2**, 2022 JCR IF=2.3, Rank 42/86 in Orthopedics). (2023).
- *Frontiers in Sports and Active Living – "Strategies in improving and encouraging walking among older adults"* (**Q2**, 2022 JCR IF=2.7, Rank 48/121 in Sport Sciences). (2023).
- *Bioengineering – "Biomechanics-Based Motion Analysis, Volume II"* (**Q2**, 2022 JCR IF=4.6, Rank 34/96 in Engineering, Biomedical). (2023).

- *Frontiers in Neurology – "Balance-Controlling Mechanism and Fall-Prevention Strategy"* (**Q2**, 2021 JCR IF=4.086, Rank 88/212 in Clinical Neurology). (2022).
- *Bioengineering – "Biomechanics-Based Motion Analysis"* (**Q2**, 2021 JCR IF=5.046, Rank 53/115 in Engineering, Biomedical). (2022).

### Editorial Board Member of Journals

- *BMC Musculoskeletal Disorders* (since 2021).

### Reviewer of Journals (in alphabetical order)

- *Acta Neurologica Belgica*
- *Age and Ageing*
- *Applied Sciences*
- *Biomedical Signal Processing and Control*
- *Biosensors*
- *Clinical Ergonomics*
- *Clinical Interventions in Aging*
- *European Medical Journal (EMJ) Medical Innovations*
- *Healthcare*
- *IEEE Transactions on Neural Systems and Rehabilitation Engineering*
- *IEEE Transactions on Robotics*
- *International Journal of Environmental Research and Public Health*
- *Journal of Biomechanics*
- *Journal of Clinical Neuroscience*
- *Journal of Healthcare Engineering*
- *Journal of Heart and Stroke*
- *Journal of Orthopaedics, Trauma and Rehabilitation*
- *Journal of the Neurological Sciences*
- *Medical Engineering and Physics*
- *Plos One*
- *Scientific Reports*
- *Sensors*
- *Somatosensory & Motor Research*
- *Sustainability*
- *Topics in Stroke Rehabilitation*

### Reviewer of Conferences

- Healthy Ageing Conference 2023, World Health Organization (WHO) Collaborating Centre (WHO CC) for Community Health Services (2023).
- 15th International Convention on Rehabilitation Engineering and Assistive Technology (i-CREATe 2022).
- IEEE World Haptics Conference 2021 (WHC)
- The Third International Conference on Biological Information and Biomedical Engineering (BIBE 2019).

## Service to Professional & Scientific Associations

### International

- Scientific Abstract Selection Committee Member, Healthy Ageing Conference 2023, World Health Organization (WHO) Collaborating Centre (WHO CC) for Community Health Services, 26-27 October 2023, Hong Kong SAR.
- Moderator and Scientific Committee Member, 15th International Convention on Rehabilitation Engineering and Assistive Technology (i-CREATe 2022), 26-29 August 2022 , Hong Kong SAR (2022).
- ISPO Auditor, Education Committee - Accreditation Sub-Committee, International Society for Prosthetics and Orthotics (ISPO) (since March 2022). Audited P&O programs:
  - BSc Programme in Prosthetics and Orthotics offered by Capital Medical University, Beijing, China; May-June 2022.
- Member, CGFNS Global Rehabilitation Health Worker Certification Initiative, United Nations Economic and Social Council (ECOSOC) (since 2021).
- Editor and Translator, Chinese version of ISPO E-Update (ISPO bi-monthly newsletters), International Society for Prosthetics and Orthotics (ISPO) (Since 2014-2018).
- Conference Organization Committee Member, The 7th Beijing International Forum on Rehabilitation (2012).

### National

- Executive Member, China Association of Assistive Products (CAAP) – Foot Assistive Products Sub-society 中国康复辅助器具协会足部辅具专业委员会常委 (2023-2028).
- Conference Organization Committee Member, The 6th National Congress of the China Disabled Persons Federation (2013).

### Regional / Local

- Founding Member, Henan – Hong Kong Joint Research Center for Diagnosis and Physical Rehabilitation of Scoliosis 医工融合 - 豫港脊柱侧弯诊疗与运动康复联合研究中心 (2023/01/01-2027/12/31).
- Founding Academic Committee Member, Henan Society for Management and Sport Rehabilitation of Ankle-Foot and Spinal Disorders 河南省足踝和脊柱异常矫治与运动康复专委会学术委员会专家组 委员 (Since 2020).
- Conference Organization Committee Member, Jockey Club Smart Aging Hub: Opening Ceremony & Symposium, PolyU (2018).

## Professional Membership

- Founding member, HKMHDIA BME Industrial Alumni Association, Hong Kong Medical and Healthcare Device Industries Association (HKMHDIA) (Since 2022).
- Member, International Society for Prosthetics and Orthotics (ISPO, N10958) (Since 2016).
- Member, World Association for Chinese Biomedical Engineers (WACBE) (Since 2015).
- Member, Chinese Association of Rehabilitation Medicine 中国康复医学会(M1900013034M, M196600002A) (Since 2016).
- Member, Chinese Society of Biomedical Engineering - Rehabilitation Engineering Sub-society (Since 2015).