Ryman HASHEM | PhD

in linkedin.com/in/rymem ⚲ The Podium Institute ℹ Website
☐ +44 7522 123 226 @ ryman.hashem@eng.ox.ac.uk
⚲ Old Road Campus, Oxford, UK ⊕ New Zealand, UK

🛄 PROFESSIONAL EXPERIENCE

Present
Jul'24 | Senior Research Fellow | University of Oxford | The Podium Institute | Prof Liang He
- Developed wearable robotic systems incorporating AI-based control for impact mitigation.
- Led the design and experimental development of anatomically accurate robotic rectum.
- Contributed to interdisciplinary research projects spanning engineering and clinical applications.
- Co-authored and supported submission of competitive grant applications for translational research.

Jun'24
Jan'23 | Senior Research Fellow | University College London | WEISS Centre | Prof Daniel Stoyanov
- Developed robotic systems for surgical training within a multidisciplinary research environment.
- Authored and submitted fellowship applications to the Royal Academy of Engineering and Rosetrees.
- Collaborated with clinicians to define functional requirements for biomechatronic large-intestine.
- Collaborated with artists on public engagement related to medical robotics, including SURGE III.

Nov'22
May'21 | Postdoctoral Researcher | University of Cambridge | BIRL Laboratory | Prof Fumiya Iida
- Led the development of automated biopsy-handling platforms in collaboration with NHS clinicians.
- Developed experimental studies and contributed to journal publications and competitive proposals.
- Co-organised research events and demonstrations (e.g. Robot Lab Live, Embodied Intelligence).

Jul'19
Mar'17 | Graduate Assistant | University of Auckland | Prof Peter Xu
- Designed and implemented advanced mechatronic devices as part of academic research.
- Contributed to the organisation of academic workshops and conferences, including IEEE AMC.
- Supported public engagement and outreach activities for engineering open days and schools.

🛄 TEACHING EXPERIENCE

Present
Sep'24 | University of Oxford | Institute of Biomedical Engineering
- Supervise PhD research in musculoskeletal injury prevention and wearable robotic systems.
- Co-supervise PhD research on stretchable sensor systems, incorporating advanced fabrication.
- Mentor Master's and 4th-year research on wearable and haptic robotic systems.
- Guide 3rd-year group projects focused on wearable technology and AI for sports safety applications.

Jun'24
Mar'23 | University College London | Medical Physics and Biomedical Engineering
- Co-supervised PhD in medical robotics, including MR-safe needle insertion systems.
- Established and supervised Master's projects in medical robotics, e.g. biomimetic organ phantoms.
- Supervised 4th-year projects in biomechatronic system design, integrating CAD and FEA modelling.

Present
May'22 | The Cambridge Centre for International Research | Robotics
- Designed and delivered online robotics courses with research-led, project-based learning.
- Assessed pre-undergraduate students project work and provided academic mentoring and support.

Nov'22
May'21 | University of Cambridge | Department of Engineering
- Guided PhD researchers in completing robotics projects on manipulation and soft gripper systems.
- Supervised undergraduate and Master's research projects, including metamaterial hydrogel systems.
- Delivered lectures for a 4th-year module in Advanced Robotics, biologically inspired robotics.

Jul'19
Mar'17 | The University of Auckland | Mechanical and Mechatronics Engineering
- Delivered lectures for a 4th-year Honours module in mechatronics design and state estimation.
- Supervised and mentored 4th-year undergraduate projects in mobile robotics and SLAM.
- Delivered lab demonstrations and tutorials for the 3rd-year Control Systems module (e.g. PID).

🏦 RESEARCH FUNDING SECURED

2025   £30k proof-of-concept funding secured for the VRehab-SMA project, where I led technical development and project delivery as a contributing investigator, in collaboration with clinicians at John Radcliffe Hospital.

2022   EPSRC Impact Acceleration Account (£25k) awarded for the development of automated biopsy-handling with UR3 for cancer diagnostics. The project progressed to TRL3 and early-stage commercialisation.

2022   Awarded a grant from the p2i Consortium to participate as a business model case study focused on research translation and commercialisation (Paris).

🏦 GRANT APPLICATIONS SUBMITTED

2025   Submitted proposal to EPSRC (£480k) on architectured artificial muscles for nature-inspired musculoskeletal robotics, involving interdisciplinary collaboration across robotics, biomechanics, and biomaterials.

2025   Submitted proposal to MRC (£3.5M) on soft robotic gut-on-a-chip platforms for modelling complex enteric infectious diseases, developed through multi-institutional collaboration.

2025   Co-authored and contributed to the submission of a Japan–UK ASPIRE proposal on artificial photosynthetic cell systems within a multidisciplinary engineering biology consortium.

🎓 EDUCATION

Oct'20 Sep'15	Ph.D., Mechatronics Engineering | The University of Auckland | Prof Peter Xu › A Biologically Inspired Soft-Bodied Bellows-Driven Stomach Robot : Concept, Design and Validation. › Developed a biologically inspired soft robotic system simulating key aspects of human gastric function, leading to publications in Soft Robotics and IEEE TMECH.
Apr'15 Mar'14	ME., Mechatronics Engineering | The University of Auckland | Prof Peter Xu › Thesis : Design and Development of a Hybrid X-Y Peristaltic Table. › Engineered a novel hybrid robotic system for versatile object transport, enhancing operational efficiency and demonstrating advanced applications of peristaltic movement (IEEE AMC'16).
Jul'14 Mar'13	Diploma in proficiency for Media & Academic Studies | Auckland University of Technology › Skills for Critical Media, Academic proficiency, and Contemporary Language, New Zealand Reader.
Nov'12 Jul'08	BSME, Science in Mechatronics Engineering | AMA International University › Final project : Constructed of filling and capping machine with a pneumatic system (FESTO & SMC). › Internship completed via practical training at Aluminium milling company (GARMCO).

📑 EVIDENCE OF ESTEEM

2026   Co-organiser of an international robotics workshop at IEEE ICRA 2026 (Vienna).

2025   International research collaboration with Sant'Anna School of Advanced Studies (Pisa) on soft robotic rectum phantom development and catheter validation, including PhD student co-supervision.

2025   National biomedical collaboration with the University of Bristol on Gut-on-Chip for disease analysis.

2025   Invited speaker at international workshops, including the Hamlyn Symposium and RoboSoft workshops.

2025   Public demonstration of a VR/AR-based intubation training system during an institutional open day.

2023   Co-organiser and session chair for the Embodied Intelligence international conference (online).

2022   Presented advanced robotics research at Robot Lab Live, a flagship event of the UK Festival of Robotics.

2022   Delivered invited guest lectures on Bio-Inspired Robotics at Cambridge and Essex.

2021   Co-organised and delivered an international robotics workshop at IEEE ICRA (online).

🎓 HONOURS AND AWARDS

2023   Received a Global Talent Endorsement from the Royal Academy of Engineering.

2023   Shortlisted for the 21 to Watch award for a commercialisation project at the University of Cambridge.

2022   Semi-finalist in the Chris Abell Postdoc Business Plan Competition, Cambridge Enterprise.

2022   Awarded a grant from the p2i Consortium to participate as a business model case study in Paris.

2022   Received EPSRC Impact Acceleration Account support for the Early Career Researcher Impact Grant.

2018   Selected to deliver a public presentation for the HealthTech Award for Best Translational Research Project.

2015   Awarded a full doctoral scholarship from the Medical Technologies Centre of Research Excellence.

2015   Awarded First-class honours for the Master's degree.

💼 PROFESSIONAL ACTIVITY AND DEVELOPMENT

Present	Reviewer for leading robotics journals and conferences (IEEE TMECH, TRO, Soft Robotics, ICRA, IROS) and for UKRI research grant applications in robotics and related engineering fields.
2024	Completed professional training in scientific entrepreneurship and research translation (Oxford).
2024	Participated in researcher development and networking workshops for early career researchers (UCL).
2024	Participated in professional development seminars on inclusive and neurodiversity-aware practice.
2023	Demonstrated medical robotics research during the Science of Surgery Day at the WEISS Centre, UCL.
2022	Completed a professional programme in research commercialisation and entrepreneurship (Cambridge).

📖 PUBLICATIONS : JOURNALS

2026	Hashem, R., Awad, A., Stilli, A., Xu, W. & Stoyanov, D. Assessing a New Drug-Delivery Capsule Using a Robot that Mimics the Human Stomach. **Soft Robotics.** In preparation, June.
2026	Hashem, R., Ziting, L., He, L., Stoyanov, D., & Stilli, A. A Soft Robotic Large Intestine Simulator for Clinical Training Using Large Language Models. **Device.** In preparation April.
2026	Duanmu, Z., Hashem, R., Stommel, M., Cheng, L. K., & Xu, W. Real-Time Physics-Informed Digital Twins for a Soft Gripper with Virtual Force Sensing. **Nature Sensors.** (Submitted Jan)
. 2025	Li, J., Hashem, R., & HE, L., Holographic Feedback via Mixed Reality Sensorised Laryngoscope Training System Enhances Paediatric Intubation Training. **Advance Robotic research**. Submitted Dec.
2025	Liang, Z., Hashem, R., Lu, L., Abdelaziz, M., Bandula, S., Groenhuis, V., Stoyanov, D. & Stilli, A compact High-Performance MR Safe Pneumatic Stepper Motor. **IEEE Sensor**. Submitted Oct.
2024	Liang, Z., Lindenroth. L., Hashem, R., Bandula. S., Stoyanov, D., & Stilli, A. Magnetic Resonance Imaging-Guided Needle Insertion Robots : A Review of Systems for Liver and Kidney Interventions. **IEEE RAM.**
2023	Kazemi, S., Hashem, R., Stommel, M., Cheng, L. & Xu, W. Biomimetic Closed-loop Control of a Novel Soft Gastric Simulator Toward Emulating Antral Contraction Waves. **Soft Robotics.**
2022	Thilina, D. Lalitharatne, Costi, L., Hashem, R., Fumiya Iida et al. Face Mediated Human-Robot Interaction for Remote Medical Examination. **Scientific Reports.**
2022	Hashem, R., Kazemi, S., Stommel, M., Cheng, L. & Xu, W. SoRSS : A Soft Robot for Bio-mimicking Stomach Anatomy and Motility. **Soft Robotics.**
2022	Kazemi, S., Hashem, R., Stommel, M., Cheng, L. & Xu, W. Experimental Study on the Closed-Loop Control of a Soft Ring-Shaped Actuator for In-vitro Gastric Simulator. **IEEE TMECH.**
2021	Hashem, R., Kazimi, S., Stommel, M., Cheng, L. K. & Xu, W. A Biologically Inspired Ring-Shaped Soft Pneumatic Actuator for Large Deformations. **Soft Robotics.**
2021	Costi, L., Scimeca, L., Maiolino, P., Lalitharatne, T. D., Nanayakkara, T., Hashem, R., & Iida, F. Comparative analysis of model-based predictive shared control for delayed operation in object reaching and recognition tasks with tactile sensing. **Frontiers in Robotics and AI.**
2021	Bhattacharya, D., Hashem, R., Cheng, L., & Xu, W. Nonlinear Model Predictive Control of a Robotic Soft Esophagus. **IEEE TIE.**
2020	Hashem, R., Stommel, M., Cheng, L. K. & Xu, W. Design and Characterization of a Bellows-Driven Soft Pneumatic Actuator. `IEEE TMECH.`
2020	Dang, Y., Liu, Y., Hashem, R., Bhattacharya, D., Allen, J., Stommel, M., Cheng, L.K. & Xu, W. SoGut : A Soft Robotic Gastric Simulator. **Soft Robotics.**

📖 PUBLICATIONS : CONFERENCES

2026	Hashem, R., coussios, C.,& He,L. Adaptive Impact Mitigation Using Valve-Controlled Variable Stiffness in a Pneumatic Capsule Wearable. **IROS26**. In preparation, March.
2025	Lei, Y., Hashem, R., & He,L. A Soft Robotic Glove Providing Proprioceptive Feedback for Grip Force Regulation Training. **RoboSoft**. Accepted.
2025	Cha, L., Hashem, R., & He,L. Multi-material Direct Ink Writing and Embroidery for Stretchable Wearable Sensors. **RoboSoft**. Accepted.
2025	Liang, Z., Hashem, R., Stilli, A.& Stoyanov, D. Advancing DANIR : A 5-DoF MR-Safe Double-Arch Needle Insertion Robot for Abdominal Percutaneous Interventions.**EMBC**. Accepted.
2025	Wing, O., Hashem, R., & He, L. A Modular Dual-Mode Haptic Actuator for Low and High Frequency Feedback. **RoboSoft**.

📓 Publications : Conferences

2024   Liang, Z., Lu, C., Yang, H., Hashem, R., Abdelaziz, M., Lindenroth, L., Bandula, S., Stoyanov, D., & Stilli, A. A Novel MR Safe Double-Arch Needle Insertion Robot with Scissor-Folding Mechanism for Abdominal Interventions. **IROS.**

2024   Hashem, R., Howison, T.,Stilli, A., Stoyanov, D., Xu, W. & Iida, F. Harnessing Symmetry Breaking in Soft Robotics : A Novel Approach for Underactuated Fingers. **IROS.**

2023   Sirithunge, C., Hashem, R., & Iida, F. Estimation of Soft Body Deformation by Using Light. **TAROS.**

2023   Gilday, K., Hashem, R., Abdulali, A., & Iida, Fumiya. The Xeno-Tongue Gripper : Granular Jamming Suction Cup with Bellow-Driven Self-Morphing. **RoboSoft.**

2023   Tano, N., Hashem, R., Hardman, D.,& Iida, F. Variable Response Characteristics of a Soft Sensorized Hydrogel Using Mesoscale Cellular Structures. **RoboSoft.**

2023   Hardman, D., Hashem, R., & Iida, F. Composite Stretchable Sensors for the Detection of Asymmetric Deformations in a Soft Manipulator. **RoboSoft.**

2022   Hashem, R. & Iida, F. Embedded Soft Sensing in a Soft Ring Actuator for Aiding with the Self-Organisation of the In-Hand Rotational Manipulation. **RoboSoft.**

2017   Hashem, R., Xu, W., Stommel, M., & Cheng, L. K. FEA evaluation of ring-shaped soft actuator for stomach robot. **RiTA.**

2016   Hashem, R., Xu, W., Stommel, M., & Cheng, L. Conceptualisation and specification of a biologically-inspired, soft-bodied gastric robot. **IEEE M2VIP.**

2016   Hashem, R., Smith, B., Browne, D., Xu, W., & Stommel, M. Control of a soft-bodied xy peristaltic table for delicate sorting. **IEEE AMC.**

2016   Dirven, S., Stommel, M., Hashem, R., & Xu, W. Medically-inspired approaches for the analysis of soft-robotic motion control. **IEEE AMC.**

📓 Publications : Chapters

2026   Dang, C., Hashem, R. & Xu, W. Soft Robotics Techniques for Industrial Applications : Food Industry. Soft Robotics Letter. In preparation, March.

2026   Hashem, R., Stilli, A., Stoyanov, D. & Iida, F. Embodied Cognition : Tracing the Pathways of the Gut-Brain Axis. Embodied Intelligence. In preparation, Jun.

2022   Hashem, R., & Iida, F. Bio-Inspired Robots Imitating Human Organs with Embodied Intelligence Behaviour. **Embodied Intelligence.**

☰ Skills

Research expertise	Experimental mechatronics and robotics systems; soft robotics, biomechatronics, and physical intelligence; human-interactive and medical robotic platforms.
Engineering skills	Mechatronic system design, sensing and actuation, control and state estimation, embedded systems, rapid prototyping, and experimental validation.
Computational tools	MATLAB/Simulink, Python, and C++ for modelling, control, and data analysis.
Academic practice	Grant writing and project development; interdisciplinary collaboration; postgraduate supervision; research dissemination.

66 References

Prof Peter Xu	Prof Fumiya Iida	Prof Liang He
Chair in Mechatronics	*Professor in Robotics*	*Associate Professor*
Robotics,	Information Engineering,	Engineering Science, IBME,
University of Auckland,	University of Cambridge,	University of Oxford,
Symonds St, Auckland.	Trumpington St, Cambridge.	Old Road Campus, Oxford.
@ p.xu@auckland.ac.nz	@ fi224@eng.cam.ac.uk	@ Liang.he@eng.ox.ac.uk