

Dr Riasat Islam

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Research Interests

Researcher and educator passionate about using technology to improve healthcare, well-being, and education. Currently a Post-doc and Associate Lecturer at The Open University, my research centres on wearable and haptic technologies for rehabilitation and primary school learning. I made contributions, including high-impact journal publication and a software launch. This work has led to knowledge transfer and consultancy with a medical device startup. Additionally, I co-founded the Greentech Apps Foundation, a software non-profit with 3M+ users worldwide. I aim to create tech solutions that empower individuals and foster positive societal change.

Education & Qualifications

PhD in Computing, 2017 – 2023

The Open University, UK

Dissertation: Wearable technologies to support lower limb rehabilitation and clinical practice: user requirements, design, and evaluation. URL: <http://oro.open.ac.uk/93489>

MSc in ICT Innovation, 2013 – 2015 (European double degree programme)

University College London (UCL), UK

KTH Royal Institute of Technology, Sweden

Major: Human Computer Interaction & Design | Minor: Innovation & Entrepreneurship

Thesis: FunQuest - When Learning Becomes Fun

BSc in Engineering, 2008 - 2012

Islamic University of Technology, Bangladesh

Major: Electrical and Electronic Engineering

Thesis: Design and Implementation of an Aerial Surveillance Unit using Wireless Communication Scheme

Research Experience

Postdoctoral Research Associate, Oct 2021 – Sept 2024 (Full-time)

The Open University, UK

- Develop educational technologies for school pupils to connect them to nature.
- This project draws from citizen science, haptic technologies and human-computer interaction.

Doctoral Researcher, Aug 2017 – Oct 2023 (Full-time)

The Open University, UK

- Worked on the Haptic Bracelets project, exploring how wearable haptic devices can help lower limb rehabilitation of people with neurological conditions. This work has contributed towards a journal publication, and two more papers are in preparation.
- Worked on the MoJoXlab project, developing MoJoXlab software that can help clinicians such as physiotherapists and orthopaedic surgeons to provide objective clinical movement data of their patients using wearable inertial sensors. This work has contributed towards a high-impact journal publication, a conference paper and a software launch. Led to knowledge transfer with a medical device startup, Ai Rehab Ltd.

Research Consultant, Nov 2020 – June 2022 (Part-time)

The Open University, UK

- Developed an IoT-based system to capture movement and exercise data in-home settings of recovering knee surgery patients to help clinicians such as physiotherapists and orthopaedic surgeons make better clinical decisions.
- Conducted a real-world validation study of the Slider® device for pre-rehabilitation of knee surgery patients. (Published)
- Developed a machine learning model to calculate knee joint angle using two wearable inertial sensors for AiRehab Ltd. (Yet to be published).

Research Consultant, Feb 2020 — Sep 2020 (Part-time)

University of Hertfordshire, UK

- Led the development of the Live Emission Visualiser mobile application as part of the Innovate UK-funded, LiVETAP project. The mobile application was part of a proof of concept to help people with alerts and route planning to avoid pollution hotspots. The project was conducted in collaboration with Wolverhampton City Council.

Research Assistant, Nov 2015 – Apr 2017 (Full-time)

Uppsala University, Sweden

- Developed a web portal to visualise data from segmentation and classification of high-resolution brain tumour stem cell (Glioblastoma) images and correlating with pathological assessment and luciferase photon signal data. Developed an automated pipeline to analyse the image data in collaboration with the Centre of Image Analysis, Uppsala University.
- Using big data analysis, statistical modelling, and machine learning techniques on neuroimaging (fMRI and resting-state fMRI), epigenetics and psychometric test data. This work has led to a high-impact journal publication.

Research Intern, Apr 2015 - Aug 2015 (Part-time)

Intel Research Labs Europe, UK

Worked for Intel Collaborative Research Institute on Sustainable Connected Cities, an Intel Research Labs Europe subsidiary, on the FunQuest project, play-based outdoor learning for children in collaboration with a startup, Mission Explore. My primary task was to design a system allowing children to learn playfully and build on parent-child interaction.

Teaching Experience

Associate Lecturer, Oct 2019 – Sept 2024 (Part-time)

The Open University, UK

Responsibilities include marking assignments, conducting online and face-to-face group and one-to-one tutorial sessions, and engaging with students via emails and forums. Monitoring and peer-reviewing marked assignments of other tutors. TM111 (Introduction to Computing and Information Technology 1), TM112 (Introduction to Computing and Information Technology 2), and TM356 (Interaction Design and the User Experience).

Visiting Lecturer, Oct 2018 – Sept 2020 (Part-time)

University of Bedfordshire, UK

Curriculum design, teaching and examining: CIS099-2 - Mobile Applications Development course for undergraduates. APP010-2 - Mobile Applications course for IT Apprenticeship students.
Teaching and examining: CIS112-2 - Human-Computer Interaction (HCI) course for undergraduates. CIS113-2 - Information Technologies Industries Project course for undergraduates.
Examining: PAT002-5 - Mobile Applications Development course for undergraduates.

Teaching Assistant, Oct 2017 — Sep 2018 & Oct 2014 — Mar 2015 (Part-time)

University College London, UK

Assisted in undergraduate and postgraduate courses, running computer practical sessions. Assisting the course leaders in marking student assignments and exam invigilating.
INST0002 - Programming 1, INST0004 - Programming 2, INST0003 - Information Systems, INST0007 - Web Technologies, INST0001 - Database Systems, INST0060 - Foundations of Machine Learning and Data Science, INST0029: Server Programming and Structured Data.

Skills

Skilled in Python programming for data analysis and machine learning, utilising libraries like Pandas, NumPy, Scikit-learn, and Matplotlib. Experienced in analysing 3D optical motion capture data, such as Vicon and C3D, and working with mobile inertial sensor data from Xsens and NGIMU, covering accelerometers, gyroscope readings, and quaternions. Also familiar with Apple HealthKit data analysis. Proficient in Git version control, Linux operating systems, and MATLAB for signal processing. Experienced in cloud deployment using Google Firebase and AWS. Proficient in 3D printing and rapid prototyping for tangible models.

Journal Publications

1. **R. Islam**, D. Gooch, S. Karlakki, and B. Price, (2023). "A Device for Prehabilitation of Total Knee Replacement Surgery (Slider): Usability Study". JMIR Formative Research 2023;7:e48055. URL: <http://oro.open.ac.uk/94357>
2. T. Georgiou, **R. Islam**, S. Holland, J. Linden, B. Price, P. Mulholland, and A. Perry, (2020). "Rhythmic Haptic Cueing Using Wearable Devices as Physiotherapy for Huntington Disease: Case Study". JMIR Rehabilitation and Assistive Technologies, 7(2), article no. 18589. URL: <http://oro.open.ac.uk/71609/>
3. **R. Islam**, M. Bennasar, K. Nicholas, K. Button, S. Holland, P. Mulholland, B. Price, and M. Al-Amri (2020). "A Nonproprietary Movement Analysis System (MoJoXlab) Based on Wearable Inertial Measurement Units Applicable to Healthy Participants and Those With Anterior Cruciate Ligament Reconstruction Across a Range of Complex Tasks: Validation Study". JMIR Mhealth Uhealth, 8(6). URL: <http://oro.open.ac.uk/69997/>
4. L. Wiemerslage, **R. Islam**, C. Kamp, H. Cao, G. Olivo, F. Ence-Eriksson, S. Castillo, A. Larsen, M. Bandstein, L. Dahlberg, E. Perland, V. Gustavsson, J. Nilsson, H. Vogel, A. Schürmann, E. Larsson, M. Rask-Andersen, C. Benedict, H. Schiöth, "A DNA methylation site within the KLF13 gene is associated with orexigenic processes based on neural responses and ghrelin levels." International Journal of Obesity. 2017 Jun;41(6):990. (Impact Factor – 5.337*) URL: <https://www.nature.com/articles/ijo201743>
5. M. Razan, **R. Islam**, M. Hasan, M. Hasan, M. Islam, "A Comprehensive study of micro hydro power plant and its potential in Bangladesh", ISRN Renewable Energy Journal, Volume 2012, Article ID 635396, 10 pages, doi:10.5402/2012/635396, URL: <http://www.isrn.com/journals/re/2012/635396/>

Peer-reviewed conference, symposium and workshop publications

1. **R. Islam**, M. Bennasar, S. Holland, P. Mulholland and B. Price (2024). "Democratizing Clinical Movement Analysis: Assessing the Versatility of MoJoXlab with Open-protocol Inertial Sensors". In: 28th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES 2024), 11-13 Sep 2024, Seville, Spain.
2. L. Colucci-Gray, J. Hancock, **R. Islam**, N. Sharma, A. Manches, L. Bowers, P. Lakeman-Fraser, J. Newman, S. Mozier, S. Reuger and A. Siddharthan. (2024). "Seeing with hands and touching with eyes: recovering sensorial attention to nature in primary schools". In: First International Conference on Embodied Education 2024, 15 – 17 May, Copenhagen, Denmark
3. J. Hancock, L. Colucci-Gray, A. Siddharthan, A. Manches, N. Sharma, **R. Islam**, L. Bowers, S. Reuger, P. Lakeman-Fraser, J. Newman, S. Mozier, and R. Barry. (2023). "We felt the textures from nature and it gave us new ideas": Investigating sustainability education through primary school children's natural and digital haptic touch explorations. In: Scottish Educational Research Association Conference 2023, 22 – 24 November, Musselburgh, United Kingdom
4. **R. Islam**, D. Gooch, S. Sampath, S. Karlakki, T. Jones, C. Sayers, and B. Price (2023). "Slider®-A Novel Device For Remote Tracking Of Physiotherapy Exercises In Patients With Osteoarthritis Of The Knee: An Early Report". In: EFORT Annual Congress 2023, 24 to 26 May 2023, Vienna, Austria. URL: <https://oro.open.ac.uk/88374/>
5. **R. Islam**, S. Holland, B. Price and P. Mulholland (2019). "Gait Rehabilitation for Neurological Conditions using Wearable Devices". In: Workgroup on Interactive Systems in Health, CHI 2019: Conference on Human Factors in Computing Systems, 5 May 2019, Glasgow, United Kingdom. URL: <http://oro.open.ac.uk/66556/>
6. **R. Islam** (2018). "Wearable Haptic Devices for Gait Re-education by Rhythmic Haptic Cueing". In: 32nd International BCS Human Computer Interaction Conference (HCI 2018), 2-6 Jul 2018, Belfast, Northern Ireland, United Kingdom, BCS Learning and Development Ltd. URL: <http://oro.open.ac.uk/55976/>
7. **R. Islam**, S. Holland, T. Georgiou, B. Price, and P. Mulholland (2018). "Wearable Haptic Devices for Long-Term Gait Re-education for Neurological Conditions". In: Haptic Technologies for Healthcare, EuroHaptics 2018, 13-16 Jun 2018, Pisa, Italy. URL: <http://oro.open.ac.uk/55243/>
8. **R. Islam**, T. Georgiou, S. Holland, B. Price, and P. Mulholland (2018). "How can rhythmic haptic cueing using wearable haptic devices help gait rehabilitation for stroke survivors: a longitudinal pilot study". In: 2nd Digital Health & Wellbeing Conference 2018, 01-03 May 2018, The Open University, Milton Keynes, UK. URL: <http://oro.open.ac.uk/53030/>
9. **R. Islam**, S. Holland, B. Price, T. Georgiou, and P. Mulholland (2018). "Wearables for Long Term Gait Rehabilitation of Neurological Conditions". In: A Short Workshop on Next Steps Towards Long Term Self Tracking, CHI 2018: CHI Conference on Human Factors in Computing Systems, 21-26 Apr 2018, Montreal, QC, Canada. URL: <http://oro.open.ac.uk/53902/>

10. **R. Islam**, S. Holland, T. Georgiou, B. Price, and P. Mulholland (2018). "A longitudinal rehabilitation case study for hemiparetic gait using outdoor rhythmic haptic cueing via a wearable device". In: 27th European Stroke Conference, 11-13 Apr 2018, Athens, Greece. URL: <http://oro.open.ac.uk/53032/>
11. **R. Islam**, S. Holland, T. Georgiou, B. Price, and P. Mulholland (2018). "Gait rehabilitation by outdoor rhythmic haptic cueing using wearable technology for neurological conditions: a case study". In: ACPIN International Neurophysiotherapy Conference, 19-20 Mar 2018, Manchester, UK. URL: <http://oro.open.ac.uk/53033/>
12. C. Krona, S. Kundu, K. Holmberg-Olausson, **R. Islam**, R. Ramachandra, L. Elfineh, S. Nelander, "In vivo modeling of high grade glioma for oncology drug development", Cancer Research 77 (13 Supplement), 4813-4813, 2017. URL: http://cancerres.aacrjournals.org/content/77/13_Supplement/4813.short

Software

13. **R. Islam** and M. Al-Amri. (2020). "MoJoXlab". The Open University. URL: <https://doi.org/10.21954/ou.rd.c.4815567>

Preprints

14. M. Kabir, M. Kabir and **R. Islam** (2024). "Islamic Lifestyle Applications: Meeting the Spiritual Needs of Modern Muslims". arXiv e-prints, arXiv-2402. URL: <https://arxiv.org/pdf/2402.02061>

Reviewing Experience

- Reviewed 10+ journal articles for JMIR Publications since 2018.
- Reviewed at ACM CHI Conference for 2018, 2021 & 2023.
- Reviewed at International Conference on Knowledge-Based and Intelligent Information & Engineering Systems, 2024.

Languages

English: Full Professional Proficiency

Bengali: Native Language

Awards and Funding

- Knowledge Transfer of doctoral research output (IP) to AiRehab Ltd at an undisclosed amount (2022).
- Knowledge Transfer Voucher bid to The Open University worth £13,953.49 as a named researcher (June 2021, successful).
- NIHR Long Covid Call, bid worth £253,256.73 as co-investigator (May 2021, unsuccessful).
- The Dowager Countess Eleanor Peel Trust bid worth £25,000 as Principal Researcher for a mobile motion capture system (May 2020, unsuccessful).
- Goldcrest Charitable Trust - £75,000 scholarship for PhD Studies, 2017.
- EIT Digital Master School - 22,000 € scholarship for postgraduate studies, 2013.

Extra Curricular and Leadership Activities

- Co-founded Greentech Apps Foundation (UK, since 2015), a non-profit software organisation. We have a portfolio of 10+ apps across Android, iOS, desktop, and web platforms. We have users spread across 150 countries, with 3M+ active users and have raised £470,000+ via crowdfunding, with a team of 30+ members distributed across UK, Malaysia and Bangladesh. Currently, hold the position of Chair of the Board of Trustees and Head of R&D department.
- Co-founded Greentech Apps Limited (UK, since 2018), a software design and development agency, to generate commercial income for Greentech Apps Foundation, the parent charity. We have 4 ongoing clients in the UK and USA and have generated £100,000+ in revenue. Currently, I hold the position of Director of the company.
- Supervised a team of 4 undergraduate students to automate and control Lunatian II, a prototype lunar robot, for NASA's Fourth Annual Lunabotics Mining Competition, 2012 – 2013.