

Contact Information	Melbourne, Australia	Phone: +61 498 996 037 Email: mbilalmce@gmail.com
Research Interests	Robotics, Human-Robot Interaction, Robot Learning	
Education	PhD in Computing and Information Systems The University of Melbourne, Australia - Research Topic: Understanding and Improving Novice Kinesthetic Teaching for Robot Learning from Demonstration (PhD Thesis Link) - Supervisors: A/Prof Wafa Johal; A/Prof Nir Lipovetzky; Prof Denny Oetomo	2023 – 2026
	MSc in Mechatronics Engineering University of Engineering and Technology, Lahore, Pakistan - Research Topic: Implementation of Adaptive Variable Impedance Control for Dynamic Force Tracking on Redundant Manipulator	2018 – 2020
	BSc in Mechatronics and Control Engineering University of Engineering and Technology, Lahore, Pakistan - Awarded with Honours - Research Topic: Design and Control of 6 DoF Robotic Manipulator	2014 – 2018
Professional Experience [4+ Years]	Human-Centered Robotics Lab , National Center of Robotics and Automation, Pakistan Team Lead - Led cross-functional research to deliver three core lab projects: Collaborative Robots (5-DoF & 7-DoF), Upper Limb Exoskeleton, and Lower Limb Prosthesis - Managed technical operations, component procurement, and inter-lab research collaborations across the labs under center Research Assistant	Oct 2021 – Feb 2023 (40-hr/week) Mar 2019 – Sep 2021 (40-hr/week)
Conference Publications	[1] Muhammad Bilal, Tharaka Ratnayake, D. Antony Chacon, Nir Lipovetzky, Denny Oetomo, and Wafa Johal. <i>Design and Evaluation of AR-Based Real-Time Feedback System for Kinesthetic Robot Teaching</i>. In Proceedings of the ACM Designing Interactive Systems Conference (DIS), pp. 332–356, 2026. doi:10.1145/3800645.3812951 Honorable Mention Award [2] Muhammad Bilal, D. Antony Chacon, Nir Lipovetzky, Denny Oetomo, and Wafa Johal. 2026. <i>Investigating the Impact of Robot Degree of Redundancy on Learning from Demonstration</i>. In Proceedings of the 21st ACM/IEEE International Conference on Human-Robot Interaction (HRI), pp. 825–833, 2026. doi:10.1145/3757279.3785606	

- [3] Jiahe Pan, Sarah Schömbbs, Yan Zhang, Ramtin Tabatabaei, **Muhammad Bilal**, and Wafa Johal. *OfficeMate: Pilot Evaluation of an Office Assistant Robot*. In Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI), pp.1529-1533, 2025. doi:[10.1109/HRI61500.2025.10974132](https://doi.org/10.1109/HRI61500.2025.10974132)
- [4] Chen, Jiahao, D. Antony Chacon, **Muhammad Bilal**, Qiushi Zhou, and Wafa Johal. *Mr. LfD: A Mixed Reality Interface for Robot Learning from Demonstration*. In Proceedings of the 36th Australasian Conference on Human-Computer Interaction (OzCHI), pp. 275-285, 2024. doi:[10.1145/3726986.3727004](https://doi.org/10.1145/3726986.3727004)
- [5] **Muhammad Bilal**, Nir Lipovetzky, Denny Oetomo, and Wafa Johal. *Beyond Success: Quantifying Demonstration Quality in Learning from Demonstration*. In Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 5120-5127, 2024. doi:[10.1109/IROS58592.2024.10802187](https://doi.org/10.1109/IROS58592.2024.10802187)
- [6] Syed Ali Huzaifa, Abdurrehman Akhtar, Meeran Ali Khan, and **Muhammad Bilal**. *Detection of Parkinson's Tremor in Real Time Using Accelerometers*. In Proceedings of the IEEE 7th International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA), pp. 5-9, 2021. doi:[10.1109/ICSIMA50015.2021.9526327](https://doi.org/10.1109/ICSIMA50015.2021.9526327)
- [7] **Muhammad Bilal**, Ali Raza, Mohsin Rizwan et al. *Towards Rehabilitation of Mughal Era Historical Places Using 7-DOF Robotic Manipulator*. In Proceedings of the IEEE International Conference on Robotics and Automation in Industry (ICRAI), pp. 1-6, 2019. doi:[10.1109/ICRAI47710.2019.8967360](https://doi.org/10.1109/ICRAI47710.2019.8967360)
- [8] Muhammad Ali, **Muhammad Bilal**, M. Nadeem Akram, and Mohsin Rizwan. *Hybrid Position and Force Control for Upper Limb Rehabilitation of Stroke Patient*. American Journal of Mechanical and Industrial Engineering, 9(2), pp. 28-42, 2024. doi:[10.11648/j.ajmie.20240902.12](https://doi.org/10.11648/j.ajmie.20240902.12)
- [9] **Muhammad Bilal**, Mohsin Rizwan et al. *Design Optimization of Powered Ankle Prosthesis to Reduce Peak Power Requirement*. Science Progress, vol. 105, no. 3, pp. 1-16, 2022. doi:[10.1177/00368504221117895](https://doi.org/10.1177/00368504221117895) IF = 2.774
- [10] **Muhammad Bilal**, M. Nadeem Akram, Mohsin Rizwan. *Adaptive Variable Impedance Control for Multi-Axis Force Tracking in Uncertain Environment Stiffness with Redundancy Exploitation*. Journal of Control Engineering and Applied Informatics, vol. 24, no. 2, pp. 35-45, 2022. IF = 1.299
- [11] **Muhammad Bilal**, M. Nadeem Akram. *Indigenously Designed Development and Motion Control of Multi-DoF Robotic Manipulator*. International Research Journal of Engineering and Technology, vol. 9, no. 1, pp. 1-9, 2022.

Academic Service

- Peer reviewer for
 - International Conference on Robotics and Automation (ICRA) 2026
 - ACM/IEEE Human-Robot Interaction (HRI) Short Contr. 2025, 2026
 - IEEE Robotics and Automation Letters (RA-L) 2026
 - Conference on Robot Learning (CoRL) 2025
- Student Volunteer at HRI 2025

Tutoring	School of Computing and Information Systems, The University of Melbourne, Australia 1) AI Planning for Autonomy (COMP90054) Semester 2, 2023 — Semester 1, 2026 (Delivered 6 times) - Search algorithms and heuristic functions, Classical (AI) planning, Markov Decision Processes, Reinforcement learning, Game theory, Ethics in AI planning 2) Designing Novel Interactions (INFO90003) Semester 1, 2024 and Semester 1, 2025 (Delivered 2 times) - Development of novel interaction technologies, design and implementation of interactive systems, prototyping and evaluation of user interaction models Department of Mechatronics and Control Engineering, UET Lahore, Pakistan Graduate Assistant Oct 2018 – Mar 2019 (20-hr/week) - Supervised undergrad final year projects, including 3R planar robotic manipulator and lower limb ankle prosthesis - Prepared and graded quizzes, assignments, and maintained subject files
Awards	- Awarded Honourable Mention at ACM Designing Interactive Systems 2026, Singapore - Received PhD-Write up Award 2026, the University of Melbourne, Australia - Awarded Melbourne Teaching Certificate 2025, the University of Melbourne, Australia - Winner, Robot Competition at HRI 2024, Boulder, USA - Runner-up, Robotics Vision Summer School (RVSS) 2024, Australian National University, Kioloa Coastal Campus, Australia - Recipient of Melbourne Research Scholarship, the University of Melbourne, Australia - Awarded B.Sc. Mechatronics & Control Engineering with Honours from the University of Engineering & Technology, Lahore, Pakistan
Technical Skill-Set	- Mathematical modelling of robotic systems, including kinematics and dynamics - Development of motion planning algorithms using ROS 2 and MoveIt 2 on Linux (Ubuntu) - Simulation of robotic systems using MATLAB & Simulink, LabVIEW, and Gazebo - Statistical analysis using ANOVA and Linear/Cumulative-Link Mixed-Effects Models - Development of Vision Systems for robotic manipulation using OpenCV - Numerical computation and data analysis with NumPy, SciPy, Scikit-learn, and MATLAB - 2D and 3D CAD modelling with AutoCAD and SolidWorks. - Circuit design and simulation using Multisim, Proteus, and Autodesk Fusion - Programming proficiency in Python, R, C/C++, MATLAB, and graphical programming (LabVIEW)
Professional Memberships	- SIGCHI Melbourne chapter member (2024 – Present) - Institute for Electrical and Electronics Engineers (IEEE), Member (2025 – Present) - IEEE Robotics and Automation Society (2025 – Present) - ACM Student Membership (2025 – Present)
References	Available upon Request