




Mudassir Ibrahim Awan

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 Scholar
 LinkedIn

Education

- 2018/09 – 2025/08 **MS-Ph.D. Computer Science & Engineering**
Kyung Hee University, South Korea
Thesis: *Haptic Perception Modeling and Signal Generation for Textured Surfaces and Car Doors using Deep Learning*
Advisor: Professor Seokhee Jeon
- 2012/09 – 2016/08 **B.E. Electronics**
Karachi Institute of Economics and Technology, Pakistan
Thesis: *Image Processing based Hounding System*
Advisor: Lecturer Noman Masood

Research Experience

- 2025/09 – Present **Postdoctoral Researcher, Computer Science & Engineering**
Haptics & VR Laboratory, Kyung Hee University, South Korea

Research Projects

- **Generative Haptics and Fine Response Inference for Flexible Tactile Interfaces (Supported by: IITP Korea):** Lead a subteam developing AI-driven generative models (Text-to-Haptics) to create adaptive, high-fidelity haptic feedback for human-computer interaction (HCI) in VR/AR environments.
- **Ultra-Realistic Tactile Rendering Technology and Input/Output Software Development (Supported by: National Science and Technology Research Council, Korea):** Lead a team to develop perception-based vibration techniques and manipulate parameters to author the required tactile feedback for metaverse applications.
- **Development of Super-Sensory XR Interaction Technologies for Remote Inspection and Control in Extreme Environments (Supported by: Korea Atomic Energy Research Institute, Korea):** Lead a subteam developing super-sensory XR technologies for teleoperation, remote inspection, and control in extreme environments, combining AI-driven perception, haptic feedback, and immersive multimodal interaction.

Other Responsibilities

- **Supervision:** Supervise Master's (3) and PhD (2) students' thesis projects.
- **Collaboration:** Collaborate with industry partners and multidisciplinary teams from other universities to drive efficient progress.
- **Project Management:** Manage project timelines, guide team members, troubleshoot challenges, and oversee deliverables, including progress presentations and reporting of results.

Research Experience (continued)

2018/08 – 2025/08

MS–PhD Research Assistant, Computer Science & Engineering
Haptics & VR Laboratory, Kyung Hee University, South Korea

Research Projects

- **Text-Driven Generative Framework for Multimodal Visual and Haptic Texture Synthesis:** Developed a text-to-haptic framework using Stable Diffusion to generate texture images from text, a deep-learning model to predict haptic attributes, and a texture-authoring algorithm to synthesize vibrotactile feedback.

Led the project from concept to implementation while collaborating with fellow researchers in the Haptics & VR Lab and an industrial partner (KRISS, Korea).

- **Haptic Car Door Simulation Technology for Moving Interface (Hyundai Korea):** Quantified haptic perception of car doors through data-driven analysis of physical parameters and developed a framework for mapping perception to force generation and vice versa through in-depth user studies.

Actively collaborated with industrial partners (Hyundai Motor Company) and academic partners (KAIST) during project execution.

- **Model-Mediated Adaptive Tele-Operation for Realistic Haptic Experience Sharing (ETRI Korea):** Developed a teleoperation system capable of modeling haptic textures in real time to enable seamless perception of interacted surfaces.

Implemented and conceptualized the real-time modeling framework while handling high-frequency time-series data, configuring the teleoperation setup, and serving as the team lead alongside the principal investigator.

Other Responsibilities

- **Supervision:** Supervised Bachelor’s and Master’s students, providing guidance in research planning, experimental design, and thesis preparation.
- **Skill Development:** Organized research seminars, assisted in proposal writing with the principal investigator and mentored junior researchers, and contributed to conceptualizing new research directions.

Honors and Awards

2025/12

Independent Research Recognition (Award: KRW 1,000,000)

ITRC Program (Creative Autonomous Project), Hyper-Realistic XR Research Center, Sejong University

Led the development and technical reporting for a text-driven haptics and generative XR interaction framework along with PI; research was officially recognized with a Creative Autonomous Project award.

2018–2025

Graduate Student Scholarship (MS & PhD)

Kyung Hee University, South Korea

2019/07

Finalist - Student Innovation Challenge

Student Innovation Challenge – Virtual Reality, World Haptics Conference (WHC 2019)

Haptic Cue: Providing Torque Response of Cue-ball Impact on the Wrist

Selected Publications

- [1] **M.I. Awan**, S. Kang, D. Ko, W. Hassan, S. T. Kim, and S. Jeon, “Fourier-enhanced transformer encoder network for efficient haptic texture modeling/rendering,” *IEEE Transactions on Industrial Informatics*, 2026. [DOI: 10.1109/TII.2026.3692817](#) (IF: 9.9).
- [2] **M.I. Awan**, A. Raza, W. Hassan, K.-U. Kyung, and S. Jeon, “Quantifying haptic affection of car door through data-driven analysis of force profile,” *IEEE Access*, vol. 13, no. 2, pp. 119 726–119 739, 2025. [DOI: 10.1109/ACCESS.2025.3585067](#) (IF:3.6).
- [3] N. Myrah, **M.I. Awan**, and S. Jeon, “Text-driven generative framework for multimodal visual and haptic texture synthesis,” in *2025 IEEE World Haptics Conference (WHC)*, 2025, pp. 140–146. [DOI: 10.1109/WHC64065.2025.11123227](#)
- [4] **M.I. Awan**, W. Hassan, and S. Jeon, “Predicting perceptual haptic attributes of textured surface from tactile data based on deep cnn-lstm network,” in *Proceedings of the 29th ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2023, pp. 1–9. [DOI: 10.1109/VR57808.2023.10202318](#)
- [5] **M.I. Awan**, T. Ogay, W. Hassan, D. Ko, S. Kang, and S. Jeon, “Model-mediated teleoperation for remote haptic texture sharing: Initial study of online texture modeling and rendering,” in *2023 IEEE International Conference on Robotics and Automation (ICRA)*, 2023, pp. 12 457–12 463. [DOI: 10.1109/ICRA48891.2023.10160503](#)

Supervision/Co-supervision

- 2025/10 – Present **MS-PhD Research Projects**, Jeong-Hyun Kim, Harok Jung, Malka Rania Iqbal, Marek Hajduk, & Jiho Kim
Kyung Hee University, South Korea
Manuscripts in preparation:
- *Toward Embodied Haptic Interaction Through AI-Based Body Part Recognition*
- *From Language to Touch: Multilingual Haptic Texture Modeling and Synthesis*
- *Mouth Haptics: A Haptic Jaw Device for Simulating Chewing Sensation*
- 2024/01 – 2025/08 **PhD Research Project**, Myrah Naeem
Kyung Hee University, South Korea
Publication: *Text-Driven Generative Framework for Multimodal Visual and Haptic Texture Synthesis*, IEEE World Haptics Conference (WHC) 2025.
- 2024/03 – 2025/03 **Master Thesis**, Seungchae Kim
Kyung Hee University, South Korea
Thesis Title: *TorqueGrip360: Handheld haptic device for torque haptic feedback on wrist.*
- 2024/03 – 2024/12 **Master Research Project**, Seungchae Kim
Kyung Hee University, South Korea
Publication: *Haptic Feedback Chair for Simulating Heartbeat Sensations*, Korea Software Congress, 2024.
- 2023/03 – 2024/08 **Master Thesis**, Sama E Shan
Kyung Hee University, South Korea
Thesis Title: *Pneu-pen: A multi-model Pneumatic Haptic Pen for Stiffness, Friction and Vibrotactile Feedback.*

Outreach

Invited Talks

- 2025/07 **AI in Haptics**
Workshop, World Haptics Conference
Delivered a talk on the potential of artificial intelligence as a tool to quantify and generate accurate haptic feedback based on user-defined perceptual adjectives.
- 2024/06 **Immersive Haptic Rendering**
Venue: Korea Haptics Conference
Presented techniques for modeling and rendering haptic textures, accompanied by a live demonstration of texture rendering on a touch-based tablet interface.
- 2023/10 **Model-Mediated Teleoperation**
Venue: Korea Haptics Conference
Discussed the challenges of delivering realistic haptic feedback in teleoperation systems and proposed practical solutions for improving fidelity and stability.

Demonstrations

- 2025/07 Demonstration of a Hybrid Haptic Device and AI-Driven Car Door Profile Generation System.
In IEEE World Haptics Conference (WHC), 2025.
HapTune: An Open-Source Visual Tool for Designing User-Defined Haptic Signals.
In IEEE World Haptics Conference (WHC), 2025.
- 2024/08 Haptic Texture Rendering Using Transformer Network Integrated with Fourier Transform.
In Korea Haptics Conference (KHC), 2024.
- 2023/12 Authoring New Haptic Textures Based on Interpolation of Real Textures in Affective Space
In Korea Haptics Conference (KHC), 2023.
- 2022/04 Haptic Texture Rendering on Touch Tablet.
In World IT show, Seoul, South Korea, 2023.(Exhibition)

Professional References

Dr. Seokhee Jeon

Designation: Professor

Relation: Ph.D. Supervisor

Affiliation: Department of Computer Science and Engineering, Kyung Hee University, South Korea

Email: jeon@khu.ac.kr

Dr. Waseem Hassan

Designation: Postdoc Researcher

Relation: Research Collaborator

Affiliation: Department of Mathematics & Computer Engineering, Public University of Navarra, Spain

Email: waseem.hassan@unavarra.es

Dr. Arsen Abdulali

Designation: Lecturer in Robotics & AI

Relation: Research Collaborator

Affiliation: School of Engineering & Materials Science (SEMS), Queen Mary University of London, UK

Email: a.abdulali@qmul.ac.uk

Academic Service (Reviewer)

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|----------------|---|
| 2025 – Current | Conference on Human Factors in Computing Systems (CHI) IEEE Sensors IEEE Access |
| 2024 – Current | IEEE Transactions on Visualization and Computer Graphics (TVCG) IEEE International Symposium on Mixed and Augmented Reality (ISMAR) |
| 2023 – Current | IEEE World Haptics Conference (WHC) EuroHaptics Conference ACM Symposium on Virtual Reality Software and Technology (VRST) IEEE Conference on Ubiquitous Robots (UR) |

Full Publications List

Journal Articles

- [1] **M.I. Awan**, S. Kang, D. Ko, W. Hassan, S. T. Kim, and S. Jeon, “Fourier-enhanced transformer encoder network for efficient haptic texture modeling/rendering,” *IEEE Transactions on Industrial Informatics*, 2026. [DOI: 10.1109/TII.2026.3692817](#) (IF: 9.9).
- [2] **M.I. Awan** and S. Jeon, “Estimating perceptual attributes of haptic textures using visuo-tactile data,” *IEEE Access*, vol. 13, no. 2, pp. 109 931–109 945, 2025. [DOI: 10.1109/ACCESS.2025.3581685](#) (IF: 3.6).
- [3] **M.I. Awan**, A. Raza, W. Hassan, K.-U. Kyung, and S. Jeon, “Quantifying haptic affection of car door through data-driven analysis of force profile,” *IEEE Access*, vol. 13, no. 2, pp. 119 726–119 739, 2025. [DOI: 10.1109/ACCESS.2025.3585067](#) (IF:3.6).

Conference Proceedings

- [1] N. Myrah, **M.I. Awan**, and S. Jeon, “Text-driven generative framework for multimodal visual and haptic texture synthesis,” in *2025 IEEE World Haptics Conference (WHC)*, 2025, pp. 140–146. [DOI: 10.1109/WHC64065.2025.11123227](#)
- [2] **M.I. Awan**, K. Seungchae, and J. Seokhee, “Haptic feedback chair for simulating heartbeat sensations,” in *Proceedings of the Korea Information Science Society, Jeonnam.*, 2024, pp. 13–15.
- [3] M. Hashem, A. Raza, **M.I. Awan**, and J. Seokhee, “Pulsating feedback: Render human wrist pulse via soft pneumatic actuator,” in *Proceedings of the 2023 Korea Computer Conference of the Korea Information Science Society*, 2023, pp. 1439–1441.
- [4] **M.I. Awan**, W. Hassan, and S. Jeon, “Predicting perceptual haptic attributes of textured surface from tactile data based on deep cnn-lstm network,” in *Proceedings of the 29th ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2023, pp. 1–9. [DOI: 10.1109/UR57808.2023.10202318](#)
- [5] **M.I. Awan**, T. Ogay, W. Hassan, D. Ko, S. Kang, and S. Jeon, “Model-mediated teleoperation for remote haptic texture sharing: Initial study of online texture modeling and rendering,” in *2023 IEEE International Conference on Robotics and Automation (ICRA)*, 2023, pp. 12 457–12 463. [DOI: 10.1109/ICRA48891.2023.10160503](#)
- [6] **M.I. Awan**, A. Raza, and S. Jeon, “Dronehaptics: Encountered-type haptic interface using dome-shaped drone for 3-dof force feedback,” in *2023 20th International Conference on Ubiquitous Robots (UR)*, 2023, pp. 195–200. [DOI: 10.1109/UR57808.2023.10202318](#)

- [7] **M.I. Awan** and J. Seokhee, “Design and evaluation of lightweight deep learning models for synthesizing haptic surface textures,” in *Proceedings of the 2023 Korea Computer Conference of the Korea Information Science Society*, 2023, pp. 1427–1429.
- [8] **M.I. Awan** and J. Seokhee, “Surface texture classification based on transformer network,” in *Proceedings of HCI Korea 2023 Conference Papers*, 2023, pp. 762–764.
- [9] J. B. Joolee, W. Hassan, **M.I. Awan**, and J. Seokhee, “Haptic texture mapping on real world 3d object using surface texture and haptic model,” in *Proceedings of the 2019 Korea Computer Conference of the Korea Information Science Society*, 2019, pp. 1383–1385.
- [10] T. T. Nguyen, **M.I. Awan**, and C. Woojin, “Accurate state of charge estimation of lifepo 4 battery based on the unscented kalman filter and the particle filter,” in *Proceedings of the KIPE Conference*, 2017, pp. 126–127.
- [11] M. Nabeel, K. Aqeel, M. N. Ashraf, **M.I. Awan**, and M. Khurram, “Vibrotactile stimulation for 3d printed prosthetic hand,” in *2016 2nd International Conference on Robotics and Artificial Intelligence (ICRAI)*, 2016, pp. 202–207. [DOI: 10.1109/ICRAI48891.2023.10160503](https://doi.org/10.1109/ICRAI48891.2023.10160503)

Patents

- [1] **M.I. Awan** and S. Jeon, “Dome shaped haptic drone for multi-directional haptic interaction,” Application Pending, Korea.
- [2] **M.I. Awan**, T. Ogay, and S. Jeon, “Apparatus and method for supporting tactile texture model-based remote control,” Application Pending, US.
- [3] **M.I. Awan**, T. Ogay, and S. Jeon, “Realistic tele-sharing of haptic texture using model-mediated and adaptive telepresence,” Application Pending, Korea.