

Waseem Hassan

Postdoc

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Employment

- Post-doctoral researcher at Human Centered Computing, University of Copenhagen 2023.02.01 – Current
- Research Professor at Computer Science and Engineering Department, Kyung Hee University, South Korea 2022.11.01 – 2023.02.28
- Post-doctoral researcher at Haptics and Virtual Reality Lab, Kyung Hee University, South Korea 2022.03.01 – 2022.10.31

Education

- Kyung Hee University, Yongin-si, South Korea 2016.09.01 – 2022.02.16
Ph.D. in Computer Engineering
Title: Towards Haptic Texture Content Library: Texture Synthesis Through Automatic Model Assignment and Texture Authoring in Haptic Attribute Space
Advisor: Professor Seokhee Jeon
- Kyung Hee University, Yongin-si, South Korea 2014.09.01 – 2016.08.17
M.S. in Computer Engineering
Title: Towards Universal Haptic Library–Library-Based Haptic Texture Assignment Using Image Texture
Advisor: Professor Seokhee Jeon
- National University of Science and Technology, Pakistan 2008.09.01 – 2012.08.31
B.S. in Electrical (Telecomm) Engineering

Research Interests

Haptic texture perception and psychophysics
Machine learning for haptic content automation
Wearable and modular haptic interfaces (Hardware and Software)
Soft pneumatics for wearable haptics

Teaching

- CSE20800 Technical English 1
- CSE30900 Technical English 3

Honors and Awards

- Best student innovation challenge award, World Haptics Conference (WHC) 2019
- Outstanding paper award, Ubiquitous Robotics and Ambient Intelligence (URAI) 2019
- Outstanding paper award, Korean Computer Congress (KCC) 2016
- Doctoral research scholarship, 2016 – 2022
- Masters research scholarship, 2014 – 2016
- Graduate student scholarship, Kyung Hee University, 2014 – 2022

- President Telecomm Society at MCS, National University of Science and Technology 2011 – 2012
- Sports prefect at MCS, National University of Science and Technology 2011 – 2012
- Undergraduate merit scholarship, National University of Science and Technology, 2008 – 2009

Projects

1. Touchless AI, European Union's Horizon 2020 research and innovation program (2023-2025)
2. Haptic Modeling and Rendering Technology for Mirror World, Global Frontier, NRF Korea (2014 - 2022)
3. Perceptual Performance Enhancement of Ultrasonic Haptic Display, ETRI Korea (2016 - 2017)
4. HD Haptic Technology for Hyper Reality Contents, MSIP, IITP (2017 - 2019)
5. Drone-Based Haptic Interface with Unlimited Workspace, Basic Research, NRF Korea (2017 - 2019)
6. Development of Virtual Objects Interaction Techniques in Life-Safety Situations, Ministry of the Interior and Safety (2019 - current)
7. Haptic simulation technology for moving interface, Hyundai Korea (2022.03 - current)

Publications: Journal Articles

1. Ahsan Raza, **Waseem Hassan**, Seokhee Jeon, "Pneumatically Controlled Wearable Tactile Actuator for Multi-Modal Haptic Feedback", IEEE Access (2024)
2. Joolekha Bibi Joolee, Mohammad Shadman Hashem, **Waseem Hassan**, Seokhee Jeon, "Deep Encoder-Decoder Network Based Data-driven Method for Impact Feedback Rendering on Head During Earthquake", Virtual Reality 28, 23 (2024)
3. **Waseem Hassan**, Joolekha Bibi Joolee, and Seokhee Jeon, "Establishing Haptic Texture Attribute Space and Predicting Haptic Attributes From Image Features Using 1D-CNN", Scientific Reports 13, no. 1: 11684 (2023).
4. CheolWoo Lee, Seokhee Jeon, **Waseem Hassan**, HyeongYeop Kang, "VR unseen gaze: Inducing feeling of being stared at in virtual reality", Virtual Reality, (2023): 1-20
5. Talhan, Aishwari, Sanjeet Kumar, Hwangil Kim, **Waseem Hassan**, and Seokhee Jeon. "Multi-Mode Soft Haptic Thimble for Haptic Augmented Reality Based Application of Texture Overlaying." Displays 74 (2022): 102272.
6. **Waseem Hassan**, Ahsan Raza, Muhammad Abdullah, Hashem, Mohammad Shadman, Seokhee Jeon., "HapWheel: Bringing in-Car Controls to Driver's Fingertips by Embedding Ubiquitous Haptic Displays into a Steering Wheel." IEEE Transactions on Intelligent Transportation Systems, 2022.
7. Hashem, Mohammad Shadman, Joolekha Bibi Joolee, **Waseem Hassan**, and Seokhee Jeon. "Soft Pneumatic Fingertip Actuator Incorporating a Dual Air Chamber to Generate Multi-Mode Simultaneous Tactile Feedback." Applied Sciences 12, no. 1 (2022): 175.
8. **Waseem Hassan**, Hwangil Kim, Aishwari Talhan, and Seokhee Jeon. "A Pneumatically-Actuated Mouse for Delivering Multimodal Haptic Feedback." Applied Sciences 10, no. 16(2020): 5611
9. **Waseem Hassan**, Arsen Abdulali, and Seokhee Jeon. "Authoring new haptic textures based on interpolation of real textures in affective space." IEEE Transactions on Industrial Electronics 67, no. 1 (2019): 667-676.
10. Raza, Ahsan, **Waseem Hassan**, Tatyana Ogay, Inwook Hwang, and Seokhee Jeon. "Perceptually correct haptic rendering in mid-air using ultrasound phased array." IEEE Transactions on Industrial Electronics 67, no. 1 (2019): 736-745.
11. **Waseem Hassan**, Arsen Abdulali, Muhammad Abdullah, Sang Chul Ahn, and Seokhee Jeon. "Towards universal haptic library: Library-based haptic texture assignment using image texture and perceptual space." IEEE Transactions on Haptics 11, no. 2 (2017): 291-303.
12. Ali, Taqdir, Maqbool Hussain, Wajahat Ali Khan, Muhammad Afzal, Jamil Hussain, Rahman Ali, **Waseem Hassan**, Arif Jamshed, Byeong Ho Kang, and Sungyoung Lee. "Multi-model-based interactive authoring environment for creating shareable medical knowledge." Computer methods and programs in biomedicine 150 (2017): 41-72.
13. Abdulali, Arsen, **Waseem Hassan**, and Seokhee Jeon. "Stimuli-magnitude-adaptive sample selection for data-driven haptic modeling." Entropy 18, no. 6 (2016): 222.
14. Idris, Muhammad, Shujaat Hussain, Muhammad Hameed Siddiqi, **Waseem Hassan**, Hafiz Syed Muhammad Bilal, and Sungyoung Lee. "MRPack: Multi-algorithm execution using compute-intensive approach in map reduce." Plos One 10, no. 8 (2015): e0136259.

Publications: Conference Papers (Peer Reviewed)

1. Mudassir Ibrahim Awan*, **Waseem Hassan***, Seokhee Jeon. "Predicting Perceptual Haptic Attributes of Textured Surface from Tactile Data Based on Deep CNN-LSTM Network", Proceedings of the 29th ACM Symposium on Virtual Reality Software and Technology.
2. Mudassir Ibrahim Awan*, Tatyana Ogay*, **Waseem Hassan***, Dongbeom Ko, Sungjoo Kang, Seokhee Jeon. "Model-Mediated Teleoperation for Remote Haptic Texture Sharing: Initial Study of Online Texture Modeling and Rendering." IEEE International Conference on Robotics and Automation (ICRA) 2023
3. Hashem, Mohammad Shadman, Joolekha Bibi Joolee, **Waseem Hassan**, and Seokhee Jeon." A Silicone Based Finger-Tip Pneumatic Actuator to Render Multi-Mode Haptic Feedback." 18th International Conference on Ubiquitous Robots (UR), 2021
4. Seo, Sang-Woo, SeungJoon Kwon, **Waseem Hassan**, Aishwari Talhan, and Seokhee Jeon. "Interactive virtual-reality fire extinguisher with haptic feedback." In 25th ACM Symposium on Virtual Reality Software and Technology, pp. 1-2. 2019.
5. **Waseem Hassan**, Arsen Abdulali, and Seokhee Jeon. "Haptic Texture Authoring: A Demonstration." In International AsiaHaptics conference, pp. 18-20. Springer, Singapore, 2018.
6. Abdulali, Arsen, **Waseem Hassan**, Baek Seung Jin, and Seokhee Jeon. "Hands-On Demonstration of Heterogeneous Haptic Texturing of Mesh Models Based on Image Textures." In International AsiaHaptics conference, pp. 61-65. Springer, Singapore, 2018.
7. Raza, Ahsan, Muhammad Abdullah, **Waseem Hassan**, Arsen Abdulali, Aishwari Talhan, and Seokhee Jeon. "Painting Skill Transfer Through Haptic Channel." In International AsiaHaptics conference, pp. 66-68. Springer, Singapore, 2018.
8. Rakhmatov, Ruslan, Arsen Abdulali, **Waseem Hassan**, Minji Kim, and Seokhee Jeon. "Virtual reality bicycle with data-driven vibrotactile responses from road surface textures." In 2018 IEEE Games, Entertainment, Media Conference (GEM), pp. 1-9. IEEE, 2018.
9. Abdullah, Muhammad, **Waseem Hassan**, Ahsan Raza, and Seokhee Jeon. "Haptic Logos: Insight into the feasibility of digital haptic branding." In International conference on human haptic sensing and touch enabled computer applications, pp. 696-708. Springer, Cham, 2018.
10. Abdullah, Muhammad, Minji Kim, **Waseem Hassan**, Yoshihiro Kuroda, and Seokhee Jeon. "HapticDrone: An encountered-type kinesthetic haptic interface with controllable force feedback: Example of stiffness and weight rendering." In 2018 IEEE Haptics Symposium (HAPTICS), pp. 334-339. IEEE, 2018.
11. Abdullah, Muhammad, Minji Kim, **Waseem Hassan**, Yoshihiro Kuroda, and Seokhee Jeon. "HapticDrone: An encountered-type kinesthetic haptic interface with controllable force feedback: Initial example for 1d haptic feedback." In Adjunct Publication of the 30th Annual ACM Symposium on User Interface Software and Technology, pp. 115-117. 2017.
12. **Waseem Hassan**, Arsen Abdulali, and Seokhee Jeon. "Perceptual thresholds for haptic texture discrimination." In 2017 14th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI), pp. 293-298. IEEE, 2017. **[Outstanding paper award]**
13. Abdulali, Arsen, **Waseem Hassan**, and Seokhee Jeon. "Sample selection of multi-trial data for data-driven haptic texture modeling." In 2017 IEEE World Haptics Conference (WHC), pp. 66-71. IEEE, 2017.
14. **Waseem Hassan**, and Seokhee Jeon. "Evaluating differences between bare-handed and tool-based interaction in perceptual space." In 2016 IEEE Haptics Symposium (HAPTICS), pp. 185-191. IEEE, 2016.
15. **Waseem Hassan**, and Seokhee Jeon. "Building haptic texture perceptual space from real-life textured surfaces using multidimensional scaling." Korean Computer Congress (2016): 1390-1392. **[Outstanding paper award]**

Publications: Non-refereed Conference Papers/Poster/Demo/Abstract

1. **Waseem Hassan**, Raza, A., Abdullah, M., Jeon, S., "Friction Wheel: Bringing in-Car Controls to Driver's Fingertips by Embedding Dual Ubiquitous Haptic Friction Displays into a Steering Wheel." Student innovation challenge, World Haptics conference 2019. **[Best Student Innovation Challenge Award]**
2. **Waseem Hassan**, and Seokhee Jeon, "Heterogeneous Haptic Texture Assignment to Mesh Models Based on Image." Demonstration, SIGGRAPH 2019

3. **Waseem Hassan**, Aishwari Talhan, Tatyana Ogay, Hwangil Kim, and Seokhee Jeon, "Tactile and Kinesthetic Feedback for Safety Experience/Training Simulators: A Case Study of Fire Extinguisher.", Demonstration, SIGGRAPH 2019
4. **Waseem Hassan**, Arsen Abdulali, and Seokhee Jeon, "Authoring New Haptic Textures Based on Interpolation of Real Textures in Affective Space: A Demo", Demonstration, Haptics Symposium 2018
5. **Waseem Hassan**, and Seokhee Jeon, "Towards Universal Haptic Library Library-Based Haptic Texture Selection Using Image Texture", WIP, Eurohaptics. 2016
6. **Waseem Hassan**, Arsen Abdulali, and Seokhee Jeon, "Towards Universal Haptic Library: Library-Based Haptic Texture Selection Using Image Texture", Demonstration, Eurohaptics. 2016

Patents

1. **Waseem Hassan**, Raza, A., Abdullah, M., Jeon, S., "Apparatus for controlling electronic function module in the vehicle using steering wheel with dual ubiquitous haptic sensor." South Korean patent 1022757610000, registered July 5, 2021
2. **Waseem Hassan**, Jeon, S. "Haptic Cigarette: Creating perception of smoking using vibrotactile haptic feedback". South Korean Patent (**Application Pending**)
3. **Waseem Hassan**, Joolee, J.B., and, Jeon, S. "Establishing Haptic Texture Attribute Space and Predicting Haptic Attributes from Image Features Using 1D-CNN" South Korean Patent (**Application Pending**)

Professional Reviews

1. IEEE Transactions on Haptics (2016 - current)
2. IEEE Transactions on Industrial Electronics (2018 – special issue on Haptics)
3. IEEE Robotics and Automation Letters (2019 - current)
4. IEEE Haptics Symposium (2016 - current)
5. IEEE World Haptics Conference (2016 - current)
6. EuroHaptics Conference (2018 - current)
7. AsiaHaptics Conference (2016 - current)
8. The International Conference on Robotics and Automation (2022 - current)
9. IEEE Virtual Reality Conference (2018 - current)
10. ACM Augmented Humans Conference (2021)
11. IEEE Transactions on Vehicular Technology (2022)

Professional References

1. Dr. Seokhee Jeon
Designation: Associate Professor
Relation: Supervisor
Affiliation: Department of Computer Science and Engineering, Kyung Hee University, Korea
email: jeon@khu.ac.kr
2. Dr. Kasper Hornbæk
Designation: Professor
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3. Dr. Noman Akbar
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Relation: Senior Graduate lab mate and undergraduate classmate
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