Dr. Muhammad **Shakeel**

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Experience

Honda Research Institute Japan (HRI-JP)   *Tokyo, Japan*
SCIENTIST   *Nov. 2022 - till date*
- Research and development of novel Automatic Speech Recognition architectures in collaboration with Carnegie Mellon University.

Honda Research Institute Japan (HRI-JP)   *Tokyo, Japan*
RESEARCH INTERNSHIP   *Dec. 2021 - Aug. 2022*
- Research and development of novel Automatic Speech Recognition architectures in collaboration with Carnegie Mellon University.

COMSATS University Islamabad (CUI)   *Islamabad, Pakistan*
LECTURER   *Sep. 2015 - Mar. 2019*
- Development of clustering algorithm for ALPIDE chip data on Kintex-7 in collaboration with ALICE (CERN) and CUI.
- Involved in teaching Electronics courses at the Bachelor Level.

Smart-I   *Rome, Italy*
AI & MACHINE LEARNING ENGINEER   *Feb. 2015 - Aug. 2015*
- Design, development, and optimization of Machine Learning algorithms for real-time traffic forecasting on the roads.

Smart-I   *Rome, Italy*
MACHINE LEARNING INTERN   *Feb. 2014 - May. 2014*
- Integrated support vector machines and Kalman filter to develop real-time prediction models, reducing energy consumption by 90% for pedestrian traffic and 80% for road traffic.

Human-Robot Informatics Lab - Tohoku University   *Sendai, Japan*
VISITING TRAINEE   *Sep. 2013 - Dec. 2013*
- Environmental sensing using a millimeter wave sensor equipped on a 3D rotation table.

Education

Tokyo Institute of Technology   *Tokyo, Japan*
PH.D. IN SYSTEMS AND CONTROL ENGINEERING   *Sep. 2019 - Sep. 2022*
Thesis title: Anomaly detection and classification in multi-sensor systems using deep learning

Sapienza University of Rome   *Rome, Italy*
MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE AND ROBOTICS ENGINEERING   *Jan. 2012 - Jan. 2015*
Thesis title: 3D Measurement and Environmental Sensing using Millimeter-wave Sensor

COMSATS University Islamabad   *Islamabad, Pakistan*
BACHELOR'S DEGREE IN ELECTRONICS   *Sep. 2006 - Sep. 2010*
Thesis title: Multi-Task Autonomous Robot Using Reconfigurable Media (FPGA) and Machine Vision Techniques

Honors and Awards

INTERNATIONAL

2019	**MEXT**, Fully funded Ph.D. Research Fellowship (Japanese Government Scholarship)	*Tokyo, Japan*
2014	**GALACTIC PROBLEM-SOLVER**, Participated in International Space Apps Challenge 2014	*Rome, Italy*
2013	**JASSO**, Student Exchange Support Program (Scholarship for Short-term Study in Japan)	*Sendai, Japan*
2013	**TOHOKU UNIVERSITY EXCHANGE PROGRAMME**, Student Mobility Scholarship for Master's thesis	*Rome, Italy*
2012	**ERASMUS MUNDUS**, EU scholarship for seeking Master's degree in AI & Robotics	*Rome, Italy*

Extracurricular Activities

- Elected and served as a Vice-President in 2020-2021 for Pakistan Student Association Japan (PSAJ).
- Served as a staff volunteer for IJCAI-PRICAI 2020 conference held online from January 7-15, 2021.

Scientific Activities

PUBLICATIONS

Apr. 2024	**Joint Optimization of Streaming and Non-Streaming Automatic Speech Recognition with Multi-Decoder And Knowledge Distillation**, <u>Muhammad Shakeel</u>, Yui Sudo, Yifan Peng, Shinji Watanabe	*IEEE ICASSPW HSCMA 2024*
Apr. 2024	**Contextualized Automatic Speech Recognition with Attention-Based Bias Phrase Boosted Beam Search**, Yui Sudo, <u>Muhammad Shakeel</u>, Yosuke Fukumoto, Yifan Peng, Shinji Watanabe	*IEEE ICASSP 2024*
Feb. 2024	**OWSM-CTC: An Open Encoder-Only Speech Foundation Model for Speech Recognition, Translation, and Language Identification**, Yifan Peng, Yui Sudo, <u>Muhammad Shakeel</u>, Shinji Watanabe	*Under review*
Jan. 2024	**OWSM V3. 1: Better and Faster Open Whisper-Style Speech Models Based on E-Branchformer**, Yifan Peng, Jinchuan Tian, William Chen, Siddhant Arora, Brian Yan, Yui Sudo, <u>Muhammad Shakeel</u>, Kwanghee Choi, Jiatong Shi, Xuankai Chang, Jee-weon Jung, Shinji Watanabe	*Under review*
Dec. 2023	**Reproducing Whisper-Style Training Using an Open-Source Toolkit and Publicly Available Data**, Yifan Peng, Jinchuan Tian, Brian Yan, Dan Berrebbi, Xuankai Chang, Xinjian Li, Jiatong Shi, Siddhant Arora, William Chen, Roshan Sharma, Wangyou Zhang, Yui Sudo, <u>Muhammad Shakeel</u>, Jee-weon Jung, Soumi Maiti, Shinji Watanabe	*IEEE ASRU 2023*
Sep. 2023	**Time-synchronous one-pass Beam Search for Parallel Online and Offline Transducers with Dynamic Block Training**, Yui Sudo, <u>Muhammad Shakeel</u>, Yifan Peng, Shinji Watanabe	*INTERSPEECH 2023*
Sep. 2023	**4D ASR: Joint modeling of CTC, Attention, Transducer, and Mask-Predict decoders**, Yui Sudo, <u>Muhammad Shakeel</u>, Yifan Peng, Shinji Watanabe	*INTERSPEECH 2023*
Sep. 2023	**DPHuBERT: Joint Distillation and Pruning of Self-Supervised Speech Models**, Yifan Peng, Yui Sudo, <u>Muhammad Shakeel</u>, Shinji Watanabe	*INTERSPEECH 2023*
Jan. 2023	**Metric-based multimodal meta-learning for human movement identification via footstep recognition**, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kenji Nishida and Kazuhiro Nakadai	*IEEE/SICE SII 2023*
Jan. 2023	**FPGA based Power-Efficient Edge Server to Accelerate Speech Interface for Socially Assistive Robotics**, Haris Gulzar, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kazuhiro Nakadai, Kenji Nishida, Hideharu Amano, Takeharu Eda	*IEEE/SICE SII 2023*
Sep. 2022	**Streaming Automatic Speech Recognition with Re-blocking Processing Based on Integrated Voice Activity Detection**, Yui Sudo, <u>Muhammad Shakeel</u>, Kazuhiro Nakadai, Jiatong Shi and Shinji Watanabe	*INTERSPEECH 2022*
Feb. 2022	**3D Convolution Recurrent Neural Networks for Multi-Label Earthquake Magnitude Classification**, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kenji Nishida and Kazuhiro Nakadai	*Applied Sciences (MDPI)*
Apr. 2021	**Detecting earthquakes: a novel deep learning-based approach for effective disaster response**, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kenji Nishida and Kazuhiro Nakadai	*Applied Intelligence*
Oct. 2021	**CASE: CNN Acceleration for Speech-Classification in Edge-Computing**, Haris Gulzar, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kenji Nishida and Kazuhiro Nakadai	*IEEE Cloud Summit 2021*
Jan. 2021	**EMC: Earthquake Magnitudes Classification on Seismic Signals via Convolutional Recurrent Networks**, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kenji Nishida and Kazuhiro Nakadai	*IEEE/SICE SII 2021*
Jan. 2021	**Assessment of a Beamforming Implementation Developed for Surface Sound Source Separation**, Zhi Zhong, <u>Muhammad Shakeel</u>, Katsutoshi Itoyama, Kenji Nishida, Kazuhiro Nakadai	*IEEE/SICE SII 2021*
Oct. 2015	**Environmental Sensing using Millimeter Wave Sensor for Extreme Conditions**, <u>Muhammad Shakeel</u>, Kazunori Ohno, Daniele Nardi and Satoshi Tadokoro	*IEEE SSRR 2015*

REVIEWER

2024	**ISCA**, INTERSPEECH
2024	**IEEE**, ICASSP International Conference on Acoustics, Speech, and Signal Processing
2024	**IEEE**, International Symposium on System Integration (SII)
2023	**IEEE**, International Conference on Robot and Human Interactive Communication (RO-MAN)
2023	**IEEE**, Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)
2023	**IEEE**, International Symposium on System Integration (SII)
2022	**IEEE**, 21st International Conference on Humanoid Robots (Humanoids)

ORGANIZER

2023	**WORKSHOP**, "Speech-based communication for robots and systems," workshop in IEEE International Conference on Robot and Human Interactive Communication (RO-MAN).
2023	**SESSION CHAIR**, "Robot Perception for Interaction and Communication," in IEEE International Conference on Robot and Human Interactive Communication (RO-MAN).