Hassan Ali

PhD Candidate, UNSW, Sydney

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How do I see myself?

I am a machine learning engineer and a researcher. I work to enable real-world deployment of machine learning models that people can trust and use in their daily routine tasks.

Education

Sep 2023 – Ongoing
University of New South Wales (UNSW), Sydney, Australia
PhD in Computer Science and Engineering (Full-time)
- Understanding and mitigating the effects of backdoor attacks on Deep Learning

Sep 2017 – Aug 2019
National University of Sciences and Technology (NUST), Islamabad, Pakistan
Master of Science in Electrical Engineering **(CGPA: 4.0/4.0)**
- Thesis Title: "Analyzing the Security Vulnerabilities of Deep Neural Networks: Attacks and Defenses"

Sep 2013 – Aug 2017
University of Engineering and Technology (UET), Lahore, Pakistan
Bachelor of Science in Electrical Engineering **(CGPA: 3.645/4.0)**

Work Experience

Feb 2024 - Feb 2025
University of New South Wales (UNSW)
Casual Research Assistant, Junior Software Developer (Dr. Arash Shaghaghi)
- Large Language Models

Sep 2021 - Sep 2023
Information Technology University (ITU)
Research Assistant (Dr. Junaid Qadir)
- Human-centric Robust ML-driven IoT Smart Services

Jan 2021 - Nov 2021
Information Technology University (ITU)
Research Assistant (Dr. Junaid Qadir)
- Mitigating Anti-social Behavior through Beneficial AI

Tools and skillset

- Python, PyTorch, TensorFlow (last 5 years)
- Java, C, MATLAB, Verilog, VHDL, HTML

Publications

2025

1. Chen, X., **Ali, H.**, Shaghaghi, A., Kanhere, S. S. & Jha, S. *TOSense–What Did You Just Agree to?* in *2025 IEEE 50th Conference on Local Computer Networks (LCN)* (2025), 1–4.
2. Chen, X., **Ali, H.**, Shaghaghi, A., Kanhere, S. S. & Jha, S. *TOSense: We Read, You Click* in *2025 55th Annual IEEE/IFIP International Conference on Dependable Systems and Networks-Supplemental Volume (DSN-S)* (2025), 263–264.
3. Nofal, A. B., **Ali, H.**, Hadi, M., Ahmad, A., Qayyum, A., Johri, A., Al-Fuqaha, A. & Qadir, J. AI-enhanced interview simulation in the metaverse: Transforming professional skills training through VR and generative conversational AI. *Computers and Education: Artificial Intelligence* **8,** 100347. doi:10.1016/j.caeai.2024.100347 (2025).

2024

4. **Ali, H.**, Javed, R. T., Qayyum, A., AlGhadhban, A., Alazmi, M., Alzamil, A., Al-utaibi, K. & Qadir, J. Robust Encrypted Inference in Deep Learning: A Pathway to Secure Misinformation Detection. *IEEE Transactions on Dependable and Secure Computing.* doi:10.1109/tdsc.2024.3447629 (2024).
5. **Ali, H.**, Nepal, S., Kanhere, S. S. & Jha, S. *Adversarially Guided Stateful Defense Against Backdoor Attacks in Federated Deep Learning* in *2024 Annual Computer Security Applications Conference (ACSAC)* (2024), 794–809. doi:10.1109/ACSAC63791.2024.00070.
6. Butt, M. A., **Ali, H.**, Qayyum, A., Sultani, W., Al-Fuqaha, A. & Qadir, J. R^2S100K: Road-Region Segmentation Dataset for Semi-supervised Autonomous Driving in the Wild. *International Journal of Computer Vision,* 1–19. doi:10.1007/s11263-024-02207-3 (2024).
7. Al-Maliki, S., Qayyum, A., **Ali, H.**, Abdallah, M., Qadir, J., Hoang, D. T., Niyato, D. & Al-Fuqaha, A. Adversarial Machine Learning for Social Good: Reframing the Adversary as an Ally. *IEEE Transactions on Artificial Intelligence.* doi:10.1109/TAI.2024.3383407 (2024).
8. Qayyum, A., Butt, M. A., **Ali, H.**, Usman, M., Halabi, O., Al-Fuqaha, A., Abbasi, Q. H., Imran, M. A. & Qadir, J. Secure and trustworthy artificial intelligence-extended reality (AI-XR) for metaverses. *ACM Computing Surveys* **56,** 1–38. doi:10.1145/3614426 (2024).

2023

9. **Ali, H.**, Butt, M. A., Filali, F., Al-Fuqaha, A. & Qadir, J. Consistent Valid Physically-Realizable Adversarial Attack Against Crowd-Flow Prediction Models. *IEEE Transactions on Intelligent Transportation Systems,* 1–16. doi:10.1109/TITS.2023.3343971 (2023).
10. **Ali, H.**, Khan, M. S., AlGhadhban, A., Alazmi, M., Alzamil, A., Al-Utaibi, K. & Qadir, J. Con-detect: Detecting adversarially perturbed natural language inputs to deep classifiers through holistic analysis. *Computers & Security* **132,** 103367. doi:10.1016/j.cose.2023.103367 (2023).
11. Butt, M. A., Qayyum, A., **Ali, H.**, Al-Fuqaha, A. & Qadir, J. Towards secure private and trustworthy human-centric embedded machine learning: An emotion-aware facial recognition case study. *Computers & Security* **125,** 103058. doi:10.1016/j.cose.2022.103058 (2023).

2022

12. **Ali, H.**, Khan, M. S., Al-Fuqaha, A. & Qadir, J. Tamp-X: Attacking explainable natural language classifiers through tampered activations. *Computers & Security* **120,** 102791. doi:10.1016/j.cose.2022.102791 (2022).

2021

13. **Ali, H.**, Khan, M. S., AlGhadhban, A., Alazmi, M., Alzamil, A., Al-Utaibi, K. & Qadir, J. All your fake detector are belong to us: evaluating adversarial robustness of fake-news detectors under black-box settings. *IEEE Access* **9,** 81678–81692. doi:10.1109/ACCESS.2021.3085875 (2021).
14. Petrick, N., Akbar, S., Cha, K. H., Nofech-Mozes, S., Sahiner, B., Gavrielides, M. A., Kalpathy-Cramer, J., Drukker, K., Martel, A. L. & BreastPathQ Challenge Group, f. t. SPIE-AAPM-NCI BreastPathQ Challenge: an image analysis challenge for quantitative tumor cellularity assessment in breast cancer histology images following neoadjuvant treatment. *Journal of Medical Imaging* **8,** 034501–034501. doi:10.1117/1.jmi.8.3.034501 (2021).

2020 15. Khalid, F., **Ali, H.**, Hanif, M. A., Rehman, S., Ahmed, R. & Shafique, M. *FaDec: A Fast Decision-based Attack for Adversarial Machine Learning* in *2020 International Joint Conference on Neural Networks (IJCNN)* (2020), 1–8. doi:10.1109/ijcnn48605.2020.9207635.

2019 16. **Ali, H.**, Khalid, F., Tariq, H. A., Hanif, M. A., Ahmed, R. & Rehman, S. SSCNets: Robustifying DNNs using Secure Selective Convolutional Filters. *IEEE Design & Test* **37,** 58–65. doi:10.1109/mdat.2019.2961325 (2019).

17. Khalid, F., **Ali, H.**, Tariq, H., Hanif, M. A., Rehman, S., Ahmed, R. & Shafique, M. *QuSecNets: Quantization-based defense mechanism for securing deep neural network against adversarial attacks* in *2019 IEEE 25th International Symposium on On-Line Testing and Robust System Design (IOLTS)* (2019), 182–187. doi:10.1109/iolts.2019.8854377.