

## Employment

---

<b>Research Scientist</b> , TCL AI Lab Hong Kong, HKSAR, China Research, Design and Development of Deep Learning Algorithms for Smart Homes	April 2020 - Present
<b>Algorithm Specialist</b> , TCL Research Hong Kong, HKSAR, China Research and development of TCL deep learning inference platform	Oct 2019 – Mar 2020
<b>Lab Engineer</b> , City University of Science and Information Technology, Pakistan, Conduct laboratory classes in Control Systems	May 2013 – Aug 2016
<b>Visiting Lecturer</b> , City University of Science and Information Technology, Pakistan Taught Programing with MATLAB	Dec 2012 – Mar 2016
<b>Teaching Assistant</b> , City University of Science and Information Technology, Pakistan Assisted professors in the preparation of checking quizzes and assignments	Oct 2012 – April 2013

## Education

---

<b>Ph.D.Electrical Engineering</b> , City University of Hong Kong, HKSAR, China Advisor: Po Lai-Man Thesis Title: Face Anti-Spoofing using Convolutional Neural Networks	Sep 2016 – Aug 2019
<b>M.S.Electrical Engineering</b> , NUCES-Peshawar, Pakistan Advisor: Muhammad Tariq Thesis Title: Object Tracking and Image Transmission in Wireless Multimedia Sensor Networks	Aug 2013 – July 2015
<b>B.Sc.Electrical Engineering</b> , CUSIT-Peshawar, Pakistan, Advisor: Adam Khan Thesis Title: Intelligent Traffic Control System	Sep 2008 – Sep 2012

## Technical Skills

---

Python, PyTorch, TensorFlow, Keras, MATLAB, Vim, ONNX, Anaconda, Linux

## Research Interest

---

- Computer Vision, Deep Learning, and Machine Learning with Applications in Video, Audio, and Image Analyses
- Decentralized Deep Learning with Applications in On-Device Training and Inference
- Multimodal Self-Supervised Learning, Neural Network Parameterization, Multimodal Large Language Models (MLLMs)

## Awards

---

- Research Tuition Scholarship 2018-2019
- Outstanding Academic Performance Award 2018
- Full-time PhD Studentship by HKSAR Government 2016-2019
- Active Student Residence Award 2018
- Bronze Medal in M.Sc Electrical Engineering 2015
- Gold Medal in B.Sc. Electrical Engineering 2012
- National ICT R&D Funds 2011-2012

# Publications

---

## Peer-reviewed Journal Articles

- K. W. Lau, L.-M. Po, and Y. A. U. Rehman, “Large separable kernel attention: Rethinking the large kernel attention design in cnn,” *Expert Systems with Applications*, vol. 236, p. 121352, 2024.
- K. W. Lau, Y. A. U. Rehman, and L.-M. Po, “Audiorepnceptionnext: A lightweight single-stream architecture for efficient audio recognition,” *Neurocomputing*, p. 127432, 2024.
- Y. A. U. Rehman, L. M. Po, and M. Liu, “Livenet: Improving features generalization for face liveness detection using convolution neural networks,” *Expert Systems with Applications*, vol. 108, pp. 159–169, 2018.
- Y. A. U. Rehman, M. Tariq, and T. Sato, “A novel energy efficient object detection and image transmission approach for wireless multimedia sensor networks,” *IEEE sensors journal*, vol. 16, no. 15, pp. 5942–5949, 2016.
- Y. Zhao, L.-M. Po, K.-W. Cheung, W.-Y. Yu, and Y. A. U. Rehman, “Scgan: Saliency map-guided colorization with generative adversarial network,” *IEEE Transactions on Circuits and Systems for Video Technology*, 2020.
- Y. A. U. Rehman, L.-M. Po, and M. Liu, “Slnet: Stereo face liveness detection via dynamic disparity-maps and convolutional neural network,” *Expert Systems with Applications*, vol. 142, p. 113002, 2020.
- Y. Zhang, L. M. Po, M. Liu, Y. A. U. Rehman, W. Ou, and Y. Zhao, “Data-level information enhancement: Motion-patch-based siamese convolutional neural networks for human activity recognition in videos,” *Expert Systems with Applications*, vol. 147, p. 113203, 2020.
- W.-F. Ou, L.-M. Po, C. Zhou, Y. A. U. Rehman, P.-F. Xian, and Y.-J. Zhang, “Fusion loss and inter-class data augmentation for deep finger vein feature learning,” *Expert Systems with Applications*, vol. 171, p. 114584, 2021.
- M. Liu, H. Fu, Y. Wei, Y. A. U. Rehman, L.-m. Po, and W. L. Lo, “Light field-based face liveness detection with convolutional neural networks,” *Journal of Electronic Imaging*, vol. 28, no. 1, p. 013003, 2019.
- M. Liu, L.-M. Po, Y. A. U. Rehman, X. Xu, Y. Li, and L. Feng, “Video copy detection by conducting fast searching of inverted files,” *Multimedia Tools and Applications*, vol. 78, no. 8, pp. 10601–10624, 2019.
- Y. Zhang, L.-M. Po, J. Xiong, Y. A. U. Rehman, and K.-W. Cheung, “Asnet: Auto-augmented siamese neural network for action recognition,” *Sensors*, vol. 21, no. 14, p. 4720, 2021.
- J. Xiong, L.-M. Po, K. W. Cheung, *et al.*, “Edge-sensitive left ventricle segmentation using deep reinforcement learning,” *Sensors*, vol. 21, no. 7, p. 2375, 2021.
- Y. Zhao, L.-M. Po, W.-Y. Yu, *et al.*, “Vegan: Video colorization with hybrid generative adversarial network,” *IEEE Transactions on Multimedia*, vol. 25, pp. 3017–3032, 2022.
- Y. A. Ur Rehman, M. Tariq, and O. U. Khan, “Improved object localization using accurate distance estimation in wireless multimedia sensor networks,” *PloS one*, vol. 10, no. 11, e0141558, 2015.
- Y. A. U. Rehman, L.-M. Po, and J. Komulainen, “Enhancing deep discriminative feature maps via perturbation for face presentation attack detection,” *Image and Vision Computing*, vol. 94, p. 103858, 2020.

## Peer-reviewed Conference Proceedings

- K. W. Lau, Y. A. U. Rehman, P. P. B. de Gusmão, L.-M. Po, L. Ma, and Y. Xie, “Fedreptop: Gradient reparametrized optimizers in federated learning,” in *Proceedings of the Asian Conference on Computer Vision*, 2024, pp. 1866–1882.
- Y. A. U. Rehman, K. W. Lau, Y. Xie, L. Ma, and J. Shen, “Exploring federated self-supervised learning for general purpose audio understanding,” in *IEEE ICASSP 2024 workshop*, IEEE, 2024.
- Y. A. U. Rehman, Y. Gao, P. P. B. De Gusmão, M. Alibeigi, J. Shen, and N. D. Lane, “L-dawa: Layer-wise divergence aware weight aggregation in federated self-supervised visual representation learning,” in *Proceedings of the IEEE/CVF International Conference on Computer Vision*, 2023, pp. 16464–16473.

- Y. A. U. Rehman, Y. Gao, J. Shen, P. P. B. de Gusmão, and N. Lane, “Federated self-supervised learning for video understanding,” in *Computer Vision–ECCV 2022: 17th European Conference, Tel Aviv, Israel, October 23–27, 2022, Proceedings, Part XXXI*, Springer, 2022, pp. 506–522.
- Y. Xie, J. Wen, K. W. Lau, Y. A. U. Rehman, and J. Shen, “What should be equivariant in self-supervised learning,” in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2022, pp. 4111–4120.
- Y. A. U. Rehman, L. M. Po, and M. Liu, “Deep learning for face anti-spoofing: An end-to-end approach,” in *2017 Signal Processing: Algorithms, Architectures, Arrangements, and Applications (SPA)*, IEEE, 2017, pp. 195–200.
- Y. A. U. Rehman, L.-M. Po, M. Liu, Z. Zou, and W. Ou, “Perturbing convolutional feature maps with histogram of oriented gradients for face liveness detection,” in *International Joint Conference: 12th International Conference on Computational Intelligence in Security for Information Systems (CISIS 2019) and 10th International Conference on European Transnational Education (ICEUTE 2019)*, Springer, 2019, pp. 3–13.
- M. Liu, L.-m. Po, Y. A. U. Rehman, X. Xu, Y. Li, and L. Feng, “A novel inverted index file based searching strategy for video copy detection,” in *2017 Signal Processing: Algorithms, Architectures, Arrangements, and Applications (SPA)*, IEEE, 2017, pp. 307–312.
- Y. Zhou, M. Kwan, K. Tolentino, *et al.*, “Udc 2020 challenge on image restoration of under-display camera: Methods and results,” in *European Conference on Computer Vision*, Springer, 2020, pp. 337–351.
- Y. A. UrRehman, A. Khan, and M. Tariq, “Modeling, design and analysis of intelligent traffic control system based on integrated statistical image processing techniques,” in *2015 12th International Bhurban Conference on Applied Sciences and Technology (IBCAST)*, IEEE, 2015, pp. 169–174.

## PhD-Thesis

- Y. A. U. Rehman, “Face anti-spoofing using convolutional neural networks,” City University of Hong Kong, 2019.

## Book Chapters

- Y. A. U. Rehman and M. Tariq, “Visual information processing and transmission in wireless multimedia sensor networks: A deep learning based practical approach,” in *Internet of Multimedia Things (IoMT)*. Elsevier, 2022, pp. 47–66.

## Projects

<b>Decentralized Image Understanding for Smart Homes</b> <b>Location:</b> AI Lab, TCL Research Hong Kong, KSAR, China	2022-current
<b>Video Understanding for Smart Homes</b> <b>Location:</b> AI Lab, TCL Research Hong Kong, KSAR, China	2019-2022
<b>Deep Learning for Image Understanding in Mobile Applications</b> <b>Location:</b> TCL Research Hong Kong, KSAR, China	2019-2021
<b>Face Presentation Attack Detection</b> <b>Location:</b> City University of Hong Kong , HKSAR, China	2016-2019
<b>Object Detection and Localization in Multimedia Sensor Networks</b> <b>Location:</b> NUCES-Peshawar, Pakistan	2013-2015

## Reviewer

---

- IEEE Access
- Elsevier Expert Systems with Applications
- KSII Transactions on Internet and Information Systems
- Elsevier Journal of Visual Communication and Image Representation
- IEEE Transactions on Circuits and Systems for Video Technology
- Elsevier Signal Processing and Image Communication

## Languages

---

- ENGLISH
- URDU
- PASHTU
- MANDARIN (Beginner)