# Shahab Ul Hassan

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## Education

**Master of Science** | *in Information Technology*                                                2020 − 2022
Universiti Teknologi PETRONAS                                                          Perak, Malaysia

***Thesis Title:*** Classification of cardiac arrhythmia using hybrid convolutional neural network and Bi-directional long short-term memory.

### *Main Contribution:*

- Analysis of the impact of the area of deep learning zone on the performance of predicting cardiovascular disease.
- Development of a novel CNN-BiLSTM model for predicting five classes of cardiac arrhythmia disease.

**Bachelor of Science** | *in Computer Science*                                                     2012 − 2016
Institute of Business and Management Sciences                                        Peshawar Pakistan

## Work Experience

**Graduate Research Assistantship Scheme**                                                            2020

∗ **Grant Funding body:** The Yayasan Universiti Teknologi PETRONAS Fundamental Research (YUTP-FRG), Grant [015LCO-244]
**Project title:** Predicting Cardiovascular Diseases Using Interpretable Machine Learning Model And Smart IOT Platform.

∗ **Grant Funding body:** Institute of Autonomous System, Centre for Research in Data Science, Grant (YUTP-FRG), Cost Centre [015LC0-308]
**Project title:** Optimization of One-Dimensional Convolutional Neural Network for Corrosion Prediction in Subsea Pipelines

## Research Interest

**Explainable Artificial Intelligence | Interpretability | Machine Learning |
Deep Learning | ECG Sensor | Biomedical Applications |**

## Publications

### Journals

∗ **Shahab Ul Hassan**, Mohd Zahid MS, Talal A.A. Abdullah, and Husain K. "Classification of cardiac arrhythmia using a convolutional neural network and bi-directional long short-term memory" Published in Sage Digital Health, 2021 (IF: 4.687). https://doi.org/10.1177/20552076221102

* **Shahab ul Hassan**, Said Jadid Abdulkadir, M Soperi Mohd Zahid and Safwan Mahmood Al-Selwi. "Local interpretable model-agnostic explanation approach for medical imaging analysis: A systematic literature review". Published in Computers in Biology and Medicine 185 (2025): 109569. (I.F = 7.0) ISI indexed Q1. https://doi.org/10.1016/j.compbiomed.2024.109569 .

* Husain K, Mohd Zahid MS, **Shahab Ul Hassan** et al. "Advances of ECG sensors from hardware, software and format interoperability perspectives". Published in Electronics ISI indexed Q2, IF: 2.690 2021; 10(2): 105. https://doi.org/10.3390/electronics10020105

* Talal A.A. Abdullah, Mohd Zahid MS, Waleed Ali and **Shahab Ul Hassan**. "B-LIME: An Improvement of LIME for Interpretable Deep Learning Classification of Cardiac Arrhythmia from ECG Signals". Published in Processes 2023, 11(2), 595; (I.F = 3.352) ISI indexed Q2. https://doi.org/10.3390/pr11020595

* Abdul Muiz Fayyaz, Said Jadid Abdulkadir, **Shahab Ul Hassan**, Safwan Mahmood Al-Selwi, et al. "The Role of Advanced Machine Learning in COVID-19 Medical Imaging: A Technical Review". Published in Results in Engineering (2025): 105154. ISI indexed Q1 (I.F = 7.9). https://doi.org/10.1016/j.rineng.2025.105154

**Conferences**

* **Shahab Ul Hassan**., Zahid, M. S. M, and Husain, K. 'Performance comparison of CNN and LSTM algorithms for arrhythmia classification'. In 2020 International Conference on Computational Intelligence (ICCI) (pp.23-228).IEEE. DOI: 10.1109/ICCI51257.2020.9247636

* **Shahab Ul Hassan**, Mohd Zahid S., and Husain, K. 'Impact of bi-directional LSTM layer variation on cardiac arrhythmia detection performance'. Published, 'The 5th international multi conference on artificial intelligence technology' (M-CAIT). (Best Paper Award)

* M. Y. Daha, M. S. M. Zahid, A. Alashhab, and **Shahab Ul Hassan,** 'Comparative Analysis of Community Detection Methods for Link Failure Recovery in Software Defined Networks', 2021 ICICyTA 2021, pp. 157–162, 2021, doi: 10.1109/ICICYTA53712.2021.9689089

* **Shahab Ul Hassan**, Said Jadid Abdulkadir, Mohd Soper Mohd Zahid, Abdul Muiz Fayyaz et al. "An Optimized CNN-LSTM Model for Detecting Cardiac Arrhythmias." Published in 2024 IEEE 8th International Conference on Signal and Image Processing Applications (ICSIPA). IEEE, 2024. DOI: 10.1109/ICSIPA62061.2024.10686688

## Conferences and Presentations

**International Conference on Computational Intelligence (ICCI) 2020**
Department of Computer and Information Science,
Universiti Teknologi PETRONAS Malaysia.

**5th International Multi-Conference on Artificial Intelligence Technology (MCAIT) 2021**
Center of the Artificial Intelligence Technology (CAIT),
Universiti Kebangsaan Malaysia.

**Si2TE Sirim invention, innovation and technology Expo 2022**
Sirim Kulim Exhibition Kedah Malaysia.

**IEEE International Conference on Signal and Image Processing Applications (ICSIPA)**
8th IEEE (2024) Conference, Concorde Hotel, Kuala Lumpur, Malaysia

## Honors and Awards

*
**Best Paper Award**
The 5th international multi-conference on artificial intelligence technology (MCAIT), organized by,
Universiti Kebangsaan Malaysia, 2021.

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**Bronze Medal**
Sirim invention, innovation technology Expo 2022 (SITE2022), 19th to 21st July 2022,
SIRIM Kulim Hi-tech Park, Kedah, Malayisa.

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**Judge**
'Oh My Code' Expo 12.0 2023, held during the 20th to 21st July 2023,
Universiti Teknologi PETRONAS (UTP), Malaysia.

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**Certificate**
Attended workshop "Producing a High-Quality and Well-researched Thesis",
conducted by CIS department on December 14, 2023.
Universiti Teknologi PETRONAS Malayisa

## Teaching Experience

**Structured Algorithm and Programing | Foundation Students**
(Lab demonstration/Observation) Universiti Teknologi PETRONAS

**Visual Programming | Foundation Students**
(Lab demonstration/Observation) Universiti Teknologi PETRONAS

**Cloud Computing | Undergraduate Students**
(Lab demonstration/Observation) Universiti Teknologi PETRONAS

**Probability and Random Processes | Undergraduate Students**
(Lab demonstration/Observation) Universiti Teknologi PETRONAS

## Skills

**Programming:**Python (NumPy, SciPy, Scikit-Learn, TensorFlow Matplotlib, Pandas), MATLAB
**Document Creation:** Microsoft Office Suite, LaTex, Origin, Overleaf.

## References

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**Dr. Yasir Hafeez**
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