# Dr. Umer Asgher

**Research Fellow – Laboratory of Human Factors and Automation in Aviation,** Department of Air Transport, Faculty of Transportation Sciences**, Czech Technical University in Prague (CTU), Prague, Czechia**

**Associate Professor, Chairperson Department of Computer Sciences** – National University of Pakistan (NUP), Islamabad, Pakistan.

**Snr Faculty - Asst. Professor – School of Interdisciplinary Engineering & Sciences (SINES), National University of Sciences and Technology (NUST), and Co-Director/Principal Investigator** - System Integration Team (SIT) **at the National Centre of Artificial Intelligence (NCAI), NUST, Islamabad, Pakistan.**

**HEC Approved PhD Supervisor**

**HEC RGMS (Research Grants Management System) – TDF Evaluator**

**Vice Chair - Institute of Electrical and Electronics Engineers (IEEE) – Robotics and Automation Society (RAS)** - Islamabad, Pakistan

**Trainer - National Centre of Artificial Intelligence (NACI) – HEC and NUST**

**PEC – Program Evaluator (Electoral Engineering, Computer Engineering and Biomedical Engineering)**

**Member Pakistan Council for Science and Technology (PCST) - Ministry of Science and Technology, Government of Pakistan**

- **Google Scholar:** https://scholar.google.com.pk **(Umer Asgher)**
- **Loop (Frontiers):** https://loop.frontiersin.org/people/534940/overview
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- **Pakistan Engineering Council (P.E.C)** – ELECT/39287 **(PROFESSIONAL ENGINEER)**
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## Education and Qualifications

- **Ph.D. Engineering, with specialization in Artificial Intelligence (AI) and Brain Computer Interface (BCI) CGPA: 4.00 / 4.00**

**National University of Sciences and Technology (NUST), Islamabad, Pakistan** (2020)
**Ph.D. Thesis:** Fixed-Value MBLL based Cognitive Hemodynamic response assessment using P-fNIRS system: Applications to Deep Learning Brain Machine Interface (BMI)
**Research areas:** Brain Computer Interface (BCI), Artificial Intelligence (AI), Neuroimaging, Machine Learning, Deep Learning and Neuroergonomics

- **M.S Industrial and Manufacturing Engineering**

**National University of Sciences and Technology (NUST), Islamabad, Pakistan** (2013)
**Research areas**: Operations research, Mathematical modeling, and Engineering System optimization.

- **M.S Computer Engineering**

**University of Engineering and Technology, (UET) Taxila, Pakistan** (2012)
**Majors and research**: Digital Signals Processing and Communication Systems

- **B.E Electrical (Electronics & Telecom) Engineering**

**National University of Sciences and Technology, Islamabad, Pakistan** (2003)
**Research**: Design and Manufacturing of Microwave Antenna

## Patent(s)

**Patent: Brain Imaging Tool for Brain Diagnosis (Class - 03); Design (Patent) No. 20087-D, Dated: 23/09/2019**
Authors: M. Hamza Asif Nizami, Umer Asgher, Sara Ali, Yasar Ayaz, M. Jawad Khan (2020), **Intellectual Property Organization of Pakistan (IPO-Pakistan), 2791/2020, Government of Pakistan, Jul 2020.**

## Book(s)

- **Advances in Neuroergonomics and Cognitive Engineering**
  **Springer** Nature Switzerland AG 2021(Springer Nature)
  ISSN 2367-3370, ISSN 2367-3389 (electronic), https://doi.org/10.1007/978-3-030-80285-1
  **Editors:** Hasan Ayaz, Umer Asgher, Lucas Paletta

- **Advances in Neuroergonomics and Cognitive Engineering**
  **Springer** International Publishing, September 2020, USA (Springer Nature)
  DOI: 10.1007/978-3-030-51041-1, ISBNs: 978-3-03-051040-4, 978-3-03-051041-1
  **Editors**: Hasan Ayaz, Umer Asgher

- **Modeling and Optimization of Supply Chain process**
  A handbook for System Engineering and Supply Chain Management
  by LAP LAMBERT Academic Publishing; ISBN: 978-3-8454-2363-0

- **Industrial Cognitive Ergonomics and Engineering Psychology**
  Editor: Umer Asgher, Topics: Cognitive Computing and Internet of Things
  Vol 35, issue 2022, AHFE International, Open Access science in Human Factors Engineering and Human Cantered Computing Date: 2022, ISBN: 978-1-958651-11-7, DOI: 10.54941/ahfe1001594.

## Web of Science (WOS) - Clarivate Analytics (JCR) Impact Factor and Scopus indexed - Journals articles

J-1. Lin, Q., Jin, S., Yin, G. *et al.* **(2024) Cortical Morphological Networks Differ Between Gyri and Sulci. *Neurosci. Bull.* (2024).** https://doi.org/10.1007/s12264-024-01262-7. **Web of Science (WoS) Impact Factor: 5.9**

J-2. Socha, V., Spak, M., Matowicki, M., Hanakova, L., Socha, L., & Asgher, U **(2024)**. **Predictability of Flight Arrival Times Using Bidirectional Long Short-Term Memory Recurrent Neural Network.** Aerospace, 11(12), 991. https://doi.org/10.3390/aerospace11120991. **Web of Science (WoS) Impact Factor: 2.1**

J-3. Hussain MS, Asgher U, Nisar S, Socha V, Shaukat A, Wang J, Feng T, Paracha RZ and Khan MA **(2024) Enhanced accuracy with Segmentation of Colorectal Polyp using NanoNetB, and Conditional Random**

**Field Test-Time Augmentation**. Front. Robot. AI 11:1387491. doi: 10.3389/frobt.2024.1387491, **Web of Science (WoS) Impact Factor: 2.9**

J-4. M.-E. Coloma-Salazar, J. Arzola-Ruiz, C.-E. Marrero-Fornaris, V. Socha, U. Asgher **(2024), A Combinatorial Approach for Optimizing Transportation System: Multi-Objective Decision-Making Framework**. Neural Network World Vol 34 (3) / 2024. http://www.nnw.cz/doi/2024/NNW.2024.34.008.pdf. **Web of Science (WoS) Impact Factor: 0.7**

J-5. Tusher HM, Nazir S, Mallam S, Yang Z, Asgher U, Rusli R. (2024), **Exploring the effects of automation malfunction on team communication and coordination in ships' engine rooms**. Process Saf Prog. 2024;1-13. doi:10.1002/prs.12571 **Web of Science (WoS) Impact Factor: 1.00**

J-6. Laraib, U.; Shaukat, A.; Khan, R.A.; Mustansar, Z.; Akram, M.U.; Asgher, U (2023). **Recognition of Children's Facial Expressions Using Deep Learned Features. Electronics 2023, 12, 2416.** https://doi.org/10.3390/electronics12112416. **Web of Science (WoS) Impact factor = 2.69**

J-7. Asgher U, Ayaz Y and Taiar R (2023) **Editorial: Advances in artificial intelligence (AI) in brain computer interface (BCI) and Industry 4.0 for human machine interaction (HMI). Front. Hum. Neurosci.** 17:1320536. doi: 10.3389/fnhum.2023.1320536. **Web of Science (WoS) Impact Factor: 2.90**

J-8. Li, Y., Feng, T., Zhang, F., Asgher, U., Yan, B., & Peng, T. (2023). **Visual search strategies of performance monitoring used in action anticipation of basketball players.** ***Brain and Behavior*****,** e3298. https://doi.org/10.1002/brb3.3298. **Web of Science (WoS) Impact factor = 3.10**

J-9. Yang, Y., Li, J., Li, T. et al (2023). **Cerebellar connectome alterations and associated genetic signatures in multiple sclerosis and neuromyelitis optica spectrum disorder. Journal of Translational Medicine 21, 352.** https://doi.org/10.1186/s12967-023-04164-w**. Web of Science (WoS) Impact factor = 8.44**

J-10. K. Khalil, U. Asgher, Y. Ayaz., (2022), **Novel fNIRS study on homogeneous symmetric feature-based transfer learning for brain-computer interface. Scientific Reports - Nature.** 12, 3198. https://doi.org/10.1038/s41598-022-06805-4**, Web of Science (WoS) Impact Factor: 4.99**

J-11. H.S. Rana, M. Umer, U. Hassan, U. Asgher (2022)**, A novel multi-criteria decision-making approach for prioritization of elective surgeries through formulation of weighted MeNTS scoring system, HELIYON – Cell,** https://doi.org/10.1016/j.heliyon.2022.e10339**, Web of Science (WoS) Impact Factor: 3.77**

J-12. U. Asgher, M. J. Khan, M. H. A. Nizami, K. Khalil, R. A., Y. Ayaz, N. Naseer., (2021), **Motor training using mental workload (MWL) with an assistive Soft Exoskeleton system; an fNIRS Study for brain-machine interface (BMI). Front. Neurorobot. |** doi: 10.3389/fnbot.2021.605751, **Web of Science (WoS) Impact Factor: 2.57**

J-13. U. Asgher, K. Khalil, M. J. Khan, R. A., S. I. Butt, Y. Ayaz, N. Naseer and S. Nazir., (2020), **Enhanced Accuracy for Multiclass Mental Workload Detection Using Long Short-Term Memory (LSTM) for Brain – Computer Interface (BCI). Front. Neurosci**. 14:584. doi: 10.3389/fnins.2020.00584, **Web of Science (WoS) Impact Factor: 3.70**

J-14. U. Asgher, R. A., N. Naseer, Y. Ayaz, M. J. Khan, and M. K. Amjad., (2019), **Assessment and Classification of Mental Workload in the Prefrontal Cortex (PFC) using Fixed-Value Modified Beer-Lambert Law, IEEE Access**, Volume (2019). vol. 7, pp. 143250-143262, doi: 10.1109/ACCESS.2019.2944965. **Web of Science (WoS) Impact Factor: 3.74**

J-15. S. Ali, F. Mehmood, M. J. Khan, Y. Ayaz, U. Asgher, H. Sadia, E. Edifor, R. Nawaz., (2020), **A Preliminary Study on Effectiveness of a Standardized Multi-Robot Therapy for Improvement in Collaborative Multi-Human Interaction of Children With ASD**," in **IEEE Access**, vol. 8, pp. 109466-109474, 2020, doi: 10.1109/ACCESS.2020.3001365. **Web of Science (WoS) Impact Factor: 3.74**

J-16. M. K. Amjad, S. I. Butt, R. Kousar, R. A., M. H. Agha, Z. Faping, N. Anjum, U. Asgher., (2018), **Recent Research Trends in Genetic Algorithm Based Flexible Job Shop Scheduling Problems,** WOS WILEY Journal: **Mathematical Problems in Engineering,** Article ID 9270802, Volume 2018, https://doi.org/10.1155/2018/9270802**, Web of Science (WoS) Impact Factor: 1.00**

J-17. S. I. Butt, U. Asgher, U. Mushtaq, R. A., F. Zhang, Y. Ayaz, M. Jamil, M. K. Amjad**.,** (2017), **Intelligent Machine Vision Based Modeling and Positioning System in Sand Casting Process, Advances in Materials Science and Engineering,** vol. 2017, Article ID 3192672, 2017. https://doi.org/10.1155/2017/3192672 **Web of Science (WoS) Impact Factor: 1.27**

J-18. N. Gardan, J. Laheurte, E. Gouy, N. Dey, E. Abdi, U. Asgher, M.A Choukou, A. Schneider, T. Redha, (2015) **Computational fluid dynamics for the nordic combined skiing jump**, **Series on Biomechanics**, IEEE, vol 29, issue number 2, (Issue Vol. 29, No. 2-3, 2015) pages 31--38, oct 2015, EID: 2-s2.0-85019397165, **SCOPUS Indexed.**

J-19. H.S. Rana, M. Umer, U. Hassan, U. Asgher, F. Jamal, A. Naseem & N. Ehsan (**2024) The application of Fuzzy Delphi Method for evaluating biopsychosocial factors for prioritization of patients, IISE Transactions on Healthcare Systems Engineering,** 14:1, 55-68, DOI: 10.1080/24725579.2023.2215247. **Scopus indexed, Q2 Cite Score Best Quartile.**

J-20. Mehmood, N.; Umer, M.; Asgher, U (2022). **Multi-Hole Drilling Tool Path Planning and Cost Management through Hybrid SFLA-ACO Algorithm for Composites and Hybrid Materials**. ***J. Compos. Sci.*** **2022**, *6*, 364. **Web of Science, & Scopus indexed.** https://doi.org/10.3390/jcs6120364. **Impact factor: 3.3 (2022)**

J-21. Rana, H., Umer, M., Hassan, U., Asgher, U., Silva-Aravena, F., & Ehsan, N. (2023). **Application of fuzzy TOPSIS for prioritization of patients on elective surgeries waiting list - A novel multi-criteria decision-making approach**. *Decision Making: Applications in Management and Engineering*. https://doi.org/10.31181/dmame060127022023r. **Scopus indexed. Q1 Cite Score.**

J-22. Mehmood, N., Umer, M. & Asgher, U. (2023), **Application of hybrid SFLA-ACO algorithm and CAM softwares for optimization of drilling tool path problems.** ***SN Appl. Sci.*** **5**, 61 (2023). https://doi.org/10.1007/s42452-022-05271-x (Springer). **Web of Science & Scopus indexed. Impact factor: 2.6 (2022)**

J-23. N. Mehmood, M. Umer, U. Asgher (2022), **Application of Hybrid SFLA And ACO Algorithm to Omega Plate for Drilling Process Planning and Cost Management,** Archives for Technical Sciences 2022, 26(1), 1-12**. Web of Science & Scopus indexed**, DOI: 10.7251/afts.2022.1426.001N. Impact factor 0.1 (2022)

J-24. O. V. Bold, R. F. Moraru, J. Grabara, U. Asgher (2015) **Environmental Impact Assessment for an Industrial Solid Waste Deposit Located in Constanta Harbour, Annals of Faculty Engineering Hunedoara – International Journal of Engineering,** 2, Vol. 13, Issue 2, pages 61-68. 8p. ISSN: 2601–2332

J-25. U. Asgher, R. A., S. I. Butt, (2013). **Mathematical Modeling of Manufacturing Process Plan, Optimization Analysis with Stochastic and DSM Modeling Techniques**. **Advanced Materials Research**, vol 816–817, pp 1174–1180. https://doi.org/10.4028/www.scientific.net/amr.816-817.1174

## Book Chapters, & International Conferences Publications (Springer, Elsevier)

C-1. V. Socha, L. Socha, L. Hanáková, P. Hanák, D. Gobozov and U. Asgher, "**Susceptibility to Flight-Simulator Induced Runway Width Visual Illusion**," *2024 New Trends in Civil Aviation (NTCA)*, Prague, Czech Republic, 2024, pp. 53-58, doi: 10.23919/NTCA60572.2024.10517854.

C-2. M. Mohsin, Z. Mustansar, R. Zafar Paracha, M. Amjad, R. Ayub Chaudary, J. Ahmad, U. Asgher (2024). **Book Chapter: Innovations in healthcare product development**, (**in Book)** by Subburaj, K., Singh, S., Ćuković, S., Sandhu, K., Meixner, G., & Petruse, R.E. (Eds.). (2024). **Smart VR/AR/MR Systems for Professionals (1st ed.). CRC Press**. https://doi.org/10.1201/9781003306078

C-3. Asgher, U., Ali, S., Ali, T., Ayaz, Y., Scataglini, S., Nazir, S., Rashed, U., Abdi, E., Khawaja, F., Taiar, R., Arzola-Ruiz, J. (2023). Socio-Cultural Factors of Industrial Workers in Low-Middle Income Countries (LMIC): Pilot Study. In: Lucas Paletta, Hasan Ayaz, and Umer Asgher (eds) Cognitive Computing and Internet of Things. AHFE (2023) International Conference. AHFE Open Access, vol 73. AHFE International, USA. http://doi.org/10.54941/ahfe1003296

C-4. Safdar, A., Ali, S., Sajid, M., Asgher, U., Ayaz, Y. (2022). **Image Classification for Project-based Learning to Differentiate Diagram and Figures**. In: Umer Asgher (eds) Industrial Cognitive Ergonomics and Engineering Psychology. AHFE (2022) International Conference. AHFE Open Access, vol 35. AHFE International, USA. http://doi.org/10.54941/ahfe1001597

C-5. Zia and U. Asgher, (2022) "**Barriers in the Implementation of Effective Intelligent Knowledge Management in the Pakistani Organizations**," 2022 International Conference on Emerging Trends in Smart Technologies (ICETST), 2022, pp. 1-6, doi: 10.1109/ICETST55735.2022.9922938

C-6. Jaffer, A., Ali, S., Khawaja, F., Ayaz, Y., Sajid, M., Asgher, U. (2022). **Personality Prediction in Human-Robot-Interaction (HRI)**. In: Umer Asgher (eds) Industrial Cognitive Ergonomics and Engineering Psychology. AHFE (2022) International Conference. AHFE Open Access, vol 35. AHFE International, USA. http://doi.org/10.54941/ahfe1001601

C-7. Iqbal, S., Khan, S., Sajid, M., Ali, S., Khawaja, F., Asgher, U., Ayaz, Y. (2022). **Novel Approach for Sensing the Humanoid Hand Finger Position Using Non-contact TMR Sensor**. In: Umer Asgher (eds) Industrial Cognitive Ergonomics and Engineering Psychology. AHFE (2022) International Conference. AHFE Open Access, vol 35. AHFE International, USA. http://doi.org/10.54941/ahfe1001599

C-8. Ammar, M., Ahmed, M., Younas, M., Qayyum, K., Khawaja, F., Asgher, U., Ali, S., Ayaz, Y. (2022). **A Chain-Driven Live Roller Mechanism for Loading and Unloading Packages on Autonomous Mobile Robots in Warehouses**. In: Umer Asgher (eds) Industrial Cognitive Ergonomics and Engineering Psychology. AHFE (2022) International Conference. AHFE Open Access, vol 35. AHFE International, USA. http://doi.org/10.54941/ahfe1001600

C-9. Zambrano-Ortiz DJ., Arzola-Ruiz J., Litardo-Velásquez RM., Ashger U. (2021) **Human-Computer Interaction (HCI) Approach for the Optimal Generation and Selection of Batches Destination Options in Steel Making Factories**. In: Ayaz H., Asgher U., Paletta L. (eds) Advances in Neuroergonomics and Cognitive Engineering.

AHFE 2021. Lecture Notes in Networks and Systems, vol 259. Springer, Cham. https://doi.org/10.1007/978-3-030-80285-1_45

C-10. Asgher U., Ruiz J. A., Ayaz Y., Sajid M., Khalil K., Ali S. (2021) **Multi-level Optimization of Reactive Power Compensation in Industrial Nets with Heuristic Modelling Techniques**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_57

C-11. Asgher U. et al. (2021) **Mathematical Modeling and Optimization of Downdraft Gasifiers Using Artificial Neural Networks (ANN) and Stochastic Programming Techniques**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_50

C-12. Ali S., Sajid M., Ayaz Y., Asgher U. (2021) **A Methodology for Integrating Project Based Learning Outcomes and Attributes via Questionnaire.** In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_49

C-13. Johar A.H. et al. (2021) **Investigation of EEG Correlate in NIRS Signal for BCI.** In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_42

C-14. Johar A.H., Gerard A., Athar N., Asgher U. (2021) **Feature Based Comparative Analysis of Online Malware Scanners (OMS)**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_51

C-15. Ali S., Mehmood F., Ayaz Y., Khan M.J., Asgher U. (2021) **Effect of Paired Stimuli on Joint Attention of Children with ASD**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_48

C-16. Khalil K. et al. (2021) **Organizational Socialization: An Important Factor for Knowledge Creation in Knowledge Based Industrial Organizations and Enterprises.** In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_59

C-17. Khalil K. et al. (2021) **Efficient Extreme Learning Machine (ELM) Based Algorithm for Electrocardiogram (ECG) Heartbeat Classification**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_41

C-18. Khalil K. et al. (2021) **Cognitive Computing for Human-Machine Interaction: An IBM Watson Implementation**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_53

C-19. Mehmood F., Ali S., Ayaz Y., Khan M.J., Asgher U. (2021) **Comparing the Effect of Active vs. Passive Robotic Interaction on Joint Attention of Children with ASD**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_40

C-20. Gerard A., Latif R., Iqbal W., Gerard N., Husnain Johar A., Asghar U. (2021) **Detection and Prevention of a Malicious Activity in Industrial Federated Cloud Computing Paradigm**. In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_52

C-21. Khalil K. et al. (2021) **An Empirical Study on Organizational Socialization and Its Relationship with Employees' Age and Knowledge Management.** In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_47

C-22. Gerard N. et al. (2021) **Detection of Subject Attention in an Active Environment Through Facial Expressions Using Deep Learning Techniques and Computer Vision.** In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_43

C-23. Oka N., Asgher U. (2021) **Changes in Prefrontal Cortex and Skeletal Muscle Metabolism Associated with Muscle Fatigue: An FNIRS Study.** In: Ayaz H., Asgher U. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1201. Springer, Cham. https://doi.org/10.1007/978-3-030-51041-1_32

C-24. U. Asgher, K. Khalil, Y. Ayaz, R. A. and M. J. Khan, **Classification of Mental Workload (MWL) using Support Vector Machines (SVM) and Convolutional Neural Networks (CNN),** (2020) – IEEE 2020 3rd International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), Sukkur, Pakistan, 2020, pp. 1-6, doi: 10.1109/iCoMET48670.2020.9073799

C-25. Asgher U., Simeón R., A. R., Arzola-Ruiz J. (2020) **Novel Metaheuristic Approach: Integration of Variables Method (IVM) and Human-Machine Interaction for Subjective Evaluation.** In: Ayaz H. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2019. Advances in Intelligent Systems and Computing, vol 953. Springer, Cham. https://doi.org/10.1007/978-3-030-20473-0_46

C-26. Asgher U., Arzola-Ruiz J., A. R., Martínez-Valdés O., Ayaz Y., Ali S. (2020) **Modeling and Multi-objective Optimization of Insulating Lining Using Heuristic Technique "Exploration of Variable Codes (EVC)".** In: Ayaz H. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2019. Advances in Intelligent Systems and Computing, vol 953. Springer, Cham. https://doi.org/10.1007/978-3-030-20473-0_42

C-27. Arzola-Ruiz J., Lastre-Aleaga A.M., Cordovés A., Asgher U. (2020) **Using Adaptive Integration of Variables Algorithm for Analysis and Optimization of 2D Irregular Nesting Problem.** In: Ayaz H. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2019. Advances in Intelligent Systems and Computing, vol 953. Springer, Cham. https://doi.org/10.1007/978-3-030-20473-0_47

C-28. Ali S., Mehmood F., Ayaz Y., Asgher U., Khan M.J. (2020) **Effect of Different Visual Stimuli on Joint Attention of ASD Children Using NAO Robot.** In: Ayaz H. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2019. Advances in Intelligent Systems and Computing, vol 953. Springer, Cham. https://doi.org/10.1007/978-3-030-20473-0_48

C-29. Ali S. et al. (2020) **Hand Gesture Based Control of NAO Robot Using Myo Armband.** In: Ayaz H. (eds) Advances in Neuroergonomics and Cognitive Engineering. AHFE 2019. Advances in Intelligent Systems and Computing, vol 953. Springer, Cham. https://doi.org/10.1007/978-3-030-20473-0_44

C-30. Hechavarría Hernández J.R., Ruiz J.A., Asgher U. (2019) **Novel Multi-objective Optimization Algorithm Incorporating Decisions Factors in Design Modeling of Hydraulic Nets**. In: Kantola J., Nazir S.,

Barath T. (eds) Advances in Human Factors, Business Management and Society. AHFE 2018. Advances in Intelligent Systems and Computing, vol 783. Springer, Cham. https://doi.org/10.1007/978-3-319-94709-9_67

C-31. J. Arzola Ruiz, Y. Díaz Hernández, U. Asgher, A. Fiol Zulueta and T. Hanne, (2018) **Mathematical Modeling and Process Optimization of the Radial Continuous Casting of Steel**, 2018 6th International Symposium on Computational and Business Intelligence (ISCBI), Basel, Switzerland, 2018, pp. 33-40, doi: 10.1109/ISCBI.2018.00017

C-32. M. J. Khan, Y. Ayaz, F. Mehmood, S. Ali, N. Naseer, U. Asgher, and M.J. Qureshi., (2018), **Enhanced classification accuracy using deep learning for mental math: an fNIRS study**, fNIRS 2018, paper ID: III-43, 5-8 October 2018 at The University of Tokyo, Tokyo, JAPAN

C-33. S. Ali, F. Mehmood, Y. Ayaz, N. Naseer, U. Asgher, M.J. Qureshi b 'and M. J. Khan (2018)., **Cognitive assessment for autistic children using robotic therapy: an fNIRS study,** fNIRS 2018, paper ID: III-46, 5-8 October 2018 at The University of Tokyo, Tokyo, JAPAN

C-34. Asgher U. et al. (2018) **Analyzing Various Functions of Prefrontal Cortex (PFC) in Decision Making via Brain Imaging Techniques**. In: Hoffman M. (eds) Advances in Cross-Cultural Decision Making. AHFE 2017. Advances in Intelligent Systems and Computing, vol 610. Springer, Cham. https://doi.org/10.1007/978-3-319-60747-4_23

C-35. Cordovés-García A., Arzola-Ruiz J., Asgher U. (2018) **Incorporating the Cultural and Decisions Factors in Multi-objective Optimization of Air Conditioning Conduit Design Process.** In: Hoffman M. (eds) Advances in Cross-Cultural Decision Making. AHFE 2017. Advances in Intelligent Systems and Computing, vol 610. Springer, Cham. https://doi.org/10.1007/978-3-319-60747-4_18

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International Journal of Soft Computing and Software Engineering [JSCSE],2013, Vol. 3, No. 3, e-ISSN: 2251-7545; doi:10.7321/jscse. v3.n3.74

C-43. U. Asgher, R. A., A. Baqai, (2013). **Modeling Of Multi-Objective Process Plan, Its Optimization using Linear Modeling Technique**, Proceedings of the 2013 International Conference on Systems, Control, Signal Processing and Informatics, SCSI 2013At: Rhodes (Rodos) Island, Greece, Vol: SCSI 2013, Vol I &II, pp:110-114, Europement.

C-44. U. Asgher and R. A., (2013). **Development of an industrial manufacturing process plan, mathematical modeling of process plan and its convex constraint analysis**, IEEE- Science and Information Conference (SAI), London, 2013, pp. 659-664. ISBN:978-0-9893193-0-0.

C-45. U. Asgher, R. A., L. Ali (2013). **Development and Modeling of an Industrial Process Plan, Its Optimization using stochastic search Optimization Technique ,** Proceedings of the 2013 International Conference on Systems, Control, Signal Processing, and Informatics; Pages :115-119, Publisher: europement.

C-46. U. Asgher, F. Akbar, R. A., A. Baqai, M.Q. Khan, (2012). **Analysis of Vendor's Satisfaction Level and Generating an Optimized Vendor Relationship Model in Public Sector Organizations of Pakistan**. Proceedings of the World Congress on Engineering and Computer Science (WCECS) 2012: San Francisco, USA, Vol II.: OALib Journal - Lecture Notes in Engineering and Computer Science.

C-47. R. A., U. Asgher (2013). **Modeling and Development of an Activity based Process Planning Matrix, Its Optimization using Design Structure Matrix (DSM)** , WSEAS - International Conf Mathematics and Computers in Business, Manufacturing and Tourism, pp 101-106, ISBN: 978-960-474-332-2.

C-48. N. Ehsan, K. Z. Waheed, U. Asghar, M. T. Nawaz, E. Mirza, S. Z. Sarwar (2010). **Effects of project manager's competency on project success**, 2010 IEEE International Conference on Management of Innovation & Technology, Singapore, 2010, pp. 107-112, doi: 10.1109/ICMIT.2010.5492830.

## Academia, Research and Industrial experience

- **Research Fellow (CTU Global Postdoc Research) – Laboratory of Human Factor and Automation in Aviation**, Department of Air Transport, Faculty of Transportation Sciences, Czech Technical University in Prague (CTU), **Prague, Czech Republic**. (**2024 to present)**

- **Co-Director/Principal Investigator - System Integration Team (SIT)** at the **National Centre of Artificial Intelligence (NCAI)**, NUST, Islamabad, Pakistan. **(2024 - present)**

- **Associate Professor, Chairperson Department of Computer Sciences– National University of Pakistan (NUP), Islamabad, Pakistan**. (2023 – 2024)

- **Snr Faculty, Asst. Professor** – School of Interdisciplinary Engineering & Sciences (SINES), National University of Sciences and Technology (NUST), Islamabad, Pakistan. **(2023 - present)**

- **Dy Director** Quality Assurance Directorate (Academic Audit and Accreditation), **National University of Sciences and Technology (NUST), Islamabad, Pakistan (**2022 – 2023)

- **Snr Researcher - Liverpool John Moores University (LJMU),** Liverpool, **England, UK** (2022)

- **Asst. Professor at Department of Mechatronics Engineering**, NUST - College of Electrical & Mechanical Engineering**, National University of Sciences and Technology (NUST), Islamabad, Pakistan (**2021 – 2022)

- **Adjunct Faculty and Doctoral Researcher** at **Department of Robotics and Artificial Intelligence (AI)**, SMME and SADA **- National University of Sciences and Technology (NUST)**, Islamabad, Pakistan (2015 – 2022)
- **Asst Prof and Cluster Chair** of **Business Intelligence and Data Analytics (BIDA)** at Sir Syed CASE institute of technology, Islamabad, Pakistan (2020 – 2022)
- **Manger Technical** - **Ministry of Planning, Development and Special Initiatives - Pakistan** (2018-2021)
- **Advisor** on Robotics and Mechatronics – **Govt of Pakistan** (2014 – 2018)
- **Adjunct Professor** at University of Petroşani, Romania (2016 )
- **Operations & Industrial Engineer, Lecturer** – College of Electrical & Mechanical Engineers (CoEME) - **Government of Pakistan** (2004 – 2018)

## Teaching experience (Engineering Faculty)

| University | Subject | Postgrad (PG) / Undergrad (UG) | Year |
|---|---|---|---|
| MCE- National University of Sciences and Technology (NUST) | Remotely Controlled Vehicles (RCV) | UG | 2009 |
| MCE- National University of Sciences and Technology (NUST) | Remotely Controlled Vehicles (RCV) & Robotics - I | UG | 2010 |
| MCE- National University of Sciences and Technology (NUST) | Remotely Controlled Vehicles (RCV) & Robotics (RCV) - II | UG | 2011 |
| SMME - National University of Sciences and Technology (NUST) | Adv Control Systems | PG | 2014 |
| SMME - National University of Sciences and Technology (NUST) | Machine Learning | PG | 2015 |
| SMME - National University of Sciences and Technology (NUST) | Optimization of engineering systems | PG | 2015 |
| SADA - National University of Sciences and Technology (NUST | Automotive Design - 1 | UG | 2015 |
| SADA - National University of Sciences and Technology (NUST) | Manufacturing Processes | UG | 2016 |
| SMME - National University of Sciences and Technology (NUST | Department of Robotics and Artificial Intelligence (AI) | PG | 2020 |
| Sir Syed CASE institute of technology (SS CASE IT) | Big Data Analytics | PG | 2021 |
| SMME - National University of Sciences and Technology (NUST) | Advanced Artificial Intelligence (AI) | Ph.D. | 2021 |
| College of E&ME - National University of Sciences and Technology (NUST) | Electric Circuits Analysis | UG | 2021 |
| Sir Syed CASE institute of technology (SS CASE IT) | Computer applications in Project Management | PG | 2021 |
| College of E&ME - National University of Sciences and Technology (NUST) | Electric Circuits Analysis | UG | 2021 |
| Sir Syed CASE institute of technology (SS CASE IT) | Software applications in Project Management | PG | 2021 |

| | | | |
|---|---|---|---|
| Sir Syed CASE institute of technology (SS CASE IT) | System Safety Engineering | PG | 2022 |
| College of E&ME - National University of Sciences and Technology (NUST) | Digital Signal Processing (DSP) | UG | 2022 |
| College of E&ME - National University of Sciences and Technology (NUST) | Research Methodologies | PG | 2022 |
| Sir Syed CASE institute of technology (SS CASE IT) | Computer applications in Project Management | PG | 2022 |
| SMME - National University of Sciences and Technology (NUST) | Artificial Intelligence (AI) [as shared faculty] | PG | 2023 |
| National University of Pakistan (NUP) | Professional Practices (Cptr Sci) | UG | 2024 |

## Instructor/Trainer (Certifications and Workshops)

Instructor/Trainer at the **National Centre of Artificial Intelligence (NACI) - National University of Sciences and Technology (NUST) and Professional Development Centre (PDC)** and involved in various AI courses, workshops and in course development of various modules:

1. **Trainer**: Workshop on Fundamentals of Artificial Intelligence (AI) under **Professional Development Centre (PDC) - National University of Sciences and Technology (NUST)**
2. **Instructor / Trainer Course development: Artificial Intelligence (AI) and Robotics (4 months Certification Course)** - PM's Kamyab Jawan Program, National Vocational and Technical Training Commission and National Information Technology Board (NITB) - Govt of Pakistan (year 2022)
3. **Instructor / Trainer Course development: Certified Artificial Intelligence Professional (CAIP) - 4 months Certification Course (**year 2023)

## Research Interests / Experience

- Artificial Intelligence (AI), Brain Computer Interface (BCI), Human Behavioral studies, Neuroscience, Neuroergonomics, Brain signals processing, Biomedical engineering, Neuro-Engineering and, fNIRS, EEG and Mental Workload studies.

- Machine learning, Deep learning, Discrete, Computer Engineering, continuous optimization, System, Process modeling, Digital signal processing and Communication systems, Optimization techniques and System design.

## Ph.D. and M.S research Thesis Supervision and Evaluation Committee

| Name | Program (M.S/Ph. D) | Research Thesis | Institute/ University | Date of completion |
|---|---|---|---|---|
| Husnain Johar (NUST Regn No: 00000274740) | **MS** – RIME (Robotics and Intelligent Machine Engineering) | Maritime Accidents Analysis and AI based HCD IoOT Larch for | SMME - National University of Sciences and Technology (NUST) | **Completed-15 Oct 2020** |

| | | | | |
|---|---|---|---|---|
| | | Operator Vigilance and cognition | | |
| Khurram Khalil (NUST Regn No: 00000273888) | **MS** – RIME (Robotics and Intelligent Machine Engineering) | Analyzing human behavior using deep learning and BMI | SMME - National University of Sciences and Technology (NUST) | **Completed - 16 Apr 2021** |
| Faisal Zia (NUST Regn No. 00000318424) | **MS** – RIME (Robotics and Intelligent Machine Engineering) | Perception of Emotion in Human Robot Interaction | SMME - National University of Sciences and Technology (NUST) | In progress |
| Hassaan Asif (NUST Reg No: 00000319639 | **MS -** RIME (Robotics and Intelligent Machine Engineering) | An Unreal Engine Based Human Robot Interaction Framework | SMME - National University of Sciences and Technology (NUST) | In progress |
| Zunera Zahid (NUST Regn No: 0000035936) | **Ph.D.** – RIME (Robotics and Intelligent Machine Engineering) | Robot Assisted Therapy for People with Special Needs | SMME - National University of Sciences and Technology (NUST) | In progress |
| Tehreem Hassan (NUST Regn No: 359153) | **Ph.D.** – RIME (Robotics and Intelligent Machine Engineering) | Emotional recognition and Intelligent Robotics | SMME - National University of Sciences and Technology (NUST) | In progress |
| Hassan Sikandar Rana (Sp- 2021/Ph. D. EM/003) | **Ph.D.** Engineering Management | Autonomous Decision-Making model using Prescriptive Analytics in Medicines | Sir Syed CASE Institute of Technology (SS CASE IT) | **Completed 2024** |
| Assad Rafique | **MS -** Department of Mechations Engineering | Cancer detection using Machine Learning algorithms | CoEME - National University of Sciences and Technology (NUST) | Completed |
| Syed Abu Rehan | **MS -** Department of Mechations Engineering | Cardiac anomalies detection using reinforcement learning | CoEME - National University of Sciences and Technology (NUST) | Completed |
| Javeria Naeem | **Ph.D.** – RIME (Robotics and Intelligent Machine Engineering) | Deep learning for plant disease detection | SMME - National University of Sciences and Technology (NUST) | In progress |
| Usman Awan | **MS.** Computer Science | OCR based text detection using machine and deep learning algorithms | Sir Syed CASE Institute of Technology (SS CASE IT) | In progress |
| Sajjad | **MS.** Computer Science | Applications of Nano-nets deep learning on brain images | Sir Syed CASE Institute of Technology (SS CASE IT) | **Completed Dec 2023** |
| Imtiaz Khan | **MS.** Computer Science | Heart anomalies assessment and management using machine learning | Sir Syed CASE Institute of Technology (SS CASE IT) | **Completed -19 June 2023** |
| Qaiser Khan | **M.S** – DME (Mechatronics Engineering) | Application of Computer Vision and Motion Planning Agritech | CoEME - National University of Sciences and Technology (NUST) | **Completed -16 Jan 2024** |

| | | | | |
|---|---|---|---|---|
| Mohsin | **M.S** – (Computing / Engineering) | Assessing Mental Health status among the university students. | SINES - National University of Sciences and Technology (NUST) | **Completed – 2 Feb 2024** |

## Certifications

- Industrial Vehicle X-ray Scanning system - NUCTECH
- Engineering Project Management
- Pro-E Certified
- C++ and A+ hardware Certification
- Contract Management Certification
- LabView Certification
- Supply Chain Management Certification
- ISO 9001:2015, 14000, Occupational Health and Safety- OHSAS Certification

## Memberships

- **Senior Member IEEE** (Institute of Electrical and Electronics Engineers) **USA** – **92774739**
- Society for Industrial and Applied Mathematics (**SIAM**) **USA** - 020085751
- **Vice President** IEEE RAS Islamabad
- SIAM (Member Society for Industrial and Applied Mathematics)
- Pakistan Engineering Council (P.E.C) – **ELECT/39287**
- The SCIence and Engineering Institute (SCIEI)
- The Science and Information Organization (SAI)
- IAENG (International Association of Engineers)
- International Association of Computer Science and Information Technology

## Editorial Board, Scientific Advisory Board (SAB), Review Editor

- Scientific Reports – Nature [WOS (Impact Factor) Journal] 2021 – present
- PLOS ONE (Editor) [WOS (Impact Factor) Journal] 2023 – present
  https://journals.plos.org/plosone/static/editorial-board
- Frontiers in Human Neuroscience [WOS (Impact Factor) Journal] 2020–present
- (Elsevier) Signal Processing [WOS (Impact Factor) Journal] 2011–present
- Frontiers in Psychology [WOS (Impact Factor) Journal] 2021 – present
- Computational Intelligence and Neuroscience (Hindawi) 2021 - present
- (Elsevier) Journal of Business Research 2020–present
- (Springer) Human – Intelligent Systems Integration 2020–present
- AI – MDPI (Topic Editor) 2021–present
- IEEE Access – WOS (Impact Factor) Journal 2019 - present

- Journal of Industrial Textiles - WOS (Impact Factor) Journal 2014- present

## Awards, Grants and Honors

**HEC Approved PhD Supervisor**

**HEC RGMS (Research Grants Management System) – TDF (Technology Development Fund) Evaluator**

**Vice Chair - Institute of Electrical and Electronics Engineers (IEEE) – Robotics and Automation Society (RAS) - Islamabad, Pakistan**

**Trainer - National Centre of Artificial Intelligence (NACI) – HEC and NUST**

**PEC – Program Evaluator (Electoral Engineering, Computer Engineering and Biomedical Engineering)**

Member Pakistan Council for Science and Technology (PCST) **- Ministry of Science and Technology, Government of Pakistan**

Instructor / Trainer - PM's Kamyab Jawan Program**, National Vocational and Technical Training Commission and National Information Technology Board (NITB) - Govt of Pakistan**

**Chief Advisor - Artificial Intelligence (AI),** Medical City Online – **UK**

**Cluster Chair** of **Business Intelligence and Data Analytics (BIDA)** at Sir Syed CASE institute of technology, Islamabad, Pakistan

National Jury (Judge) – **Artificial Intelligence (AI) TechVerse 2021, Artificial Intelligence (AI) TechVerse 2023** – HEC National Centre of Artificial Intelligence (NCAI)

**Associate Editor - Frontiers in Human Neuroscience**

**Associate Editor – PLOS ONE** (https://journals.plos.org/plosone/static/editorial-board)

**Outstanding reviewer** - Signal Processing Journal – **Elsevier**

**Four times** Research Travel Grants awarded by **National University of Sciences and Technology (NUST) – year 2012, 2015 and 2017 and 2019.** Research Travel Grant awarded by **Higher Education Commission**- **year 2015 and 2017.**

**Conference Chair and Session chair – AHFE 2015, AHFE 2016, AHFE 2017, AHFE 2018, AHFE 2019, AHFE 2020, AHFE 2021, AHFE 2022, AHFE 2023 at USA**

**Conference Advisory Board -** AHFE at USA and IEEE: CCDM-AHFE 2015, CCDM-AHFE 2016, CCDM-AHFE 2017 and CCDM-AHFE 2018, CCDM-AHFE 2019, ICEEP-AHFE 2019, CCDM-AHFE 2020, ICEEP-AHFE 2020, IEEE-ICAI 2021, ICEEP – AHFE 2021, ICEEP-AHFE 2022, and ICEEP-AHFE 2023.

**Engineering Program Evaluator (PEV)**– **Pakistan Engineering Council (P.E.C)**

**Editor Special Issue** – Artificial Intelligence Journal **(MDPI)**

**Keynote Speaker - IEEE RAS** Workshop: Intelligent Robots for Practical Application, NCAI- HEC and NUST, Pakistan

## International Scientific / Conference Committee / Advisory Board

--The 7th International Multidisciplinary Symposium- 2016 University of Petroşani Romania

--2019 7th International Conference on Modeling, Development and Strategic Management of Economic System (MDSMES-2019), Ukraine

--Scientific Advisory Board AHFE Applied Human Factors and Ergonomics (Springer and Elsevier books)

-- Scientific Advisory Board - 4th International Symposium on Human Mental Workload: Models and Applications (H-WORKLOAD 2020) will be held in Granada, Spain (3-5 December 2020) at the University of Granada

## International Conference Chair

**Springer Conference Chair - 1st International Conference on Industrial Cognitive Ergonomics and Engineering Psychology (ICEEP)** under **10th International Conference on Applied Human Factors and Ergonomics (AHFE 2019)** held at the Washington Hilton, Washington D.C. USA, July 24-28, 2019.

**Springer Conference Chair – 2nd International Conference on Industrial Cognitive Ergonomics and Engineering Psychology (ICEEP)** under **11th International Conference on Applied Human Factors and Ergonomics (AHFE 2020)** held at the San Diego, USA, July 16-20, 2020.

**IEEE Publication and Technical chair - 1st IEEE International Conference in Artificial Intelligence (ICAI'2021) – 2021,** by National Center of Artificial Intelligence (NCAI) at the premises of National University of Sciences and Technologies (NUST) in Islamabad, Pakistan on 5th, 6th, & 7th April 2021

**Springer Conference Chair – 3rd International Conference on Industrial Cognitive Ergonomics and Engineering Psychology (ICEEP)** under **12th International Conference on Applied Human Factors and Ergonomics (AHFE 2021)** held at the Manhattan, New York, USA, July 25-29, 2021.

**IEEE Program and Technical chair - 2nd IEEE International Conference in Artificial Intelligence (ICAI'2022) – 2022** by National Center of Artificial Intelligence (NCAI) at the premises of National University of Sciences and Technologies (NUST) to be held at Islamabad, Pakistan from 30-31st March 2022

**Springer Conference Chair – 4th International Conference on Industrial Cognitive Ergonomics and Engineering Psychology (ICEEP)** under **13th International Conference on Applied Human Factors and Ergonomics (AHFE 2022)** held at the Manhattan, New York, USA, July 25-29, 2022.

**IEEE Publication and Technical chair - 3rd IEEE International Conference in Artificial Intelligence (ICAI'2023) – 2023,** by National Center of Artificial Intelligence (NCAI) at the premises of National University of Sciences and Technologies (NUST) in Islamabad, Pakistan on 21-24 February 2023

**Conference Chair – 5th International Conference on Industrial Cognitive Ergonomics and Engineering Psychology (ICEEP)** under **14th International Conference on Applied Human Factors and Ergonomics (AHFE 2023)** held at the San Francisco, USA, July 24-28, 2023.

# International Projects and Grants under European Commission – EU and Higher Education Commission (HEC)

1- **CO- Principal Investigator (PI)** Project under **European Commission** - **Horizon 2020** - **Research and Innovation Staff Exchange Evaluations (RISE)** - Topic: MSCA-RISE-2018, Name: Project: Enhancing Human Performance in Complex Socio-Technical Systems - ENHANCE (Grant Agreement Number 823904)**. Project Value: 961400.00 EUR (2019 – 2024). This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 823904.**

2- **Two times winner - Seal of Excellence** awarded by the **European Commission - Horizon Europe 2023 and 2024**, **to the Dr. Umer Asgher project proposal under Marie Skłodowska-Curie Actions (MSCA)** Postdoctoral Fellowships, titled "**BRAIN-AID: Brain Haemorrhage Recognition through AI for Intracranial Neurological Aid Diagnosis"**. The" Seal of Excellence" is awarded to the top projects and signifies top-tier quality in a rigorous evaluation process, highlighting our **project's innovation, and signifies the research in advancing healthcare through cutting-edge AI technologies**.

3- **Co-Director/Principal Investigator - System Integration Team (SIT)** at the **National Centre of Artificial Intelligence (NCAI)**, NUST, Islamabad, Pakistan