

Syed Ihtesham Shah

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SHORT BIOGRAPHY

Dr. SIH Shah is a postdoctoral researcher at Vrije Universiteit Amsterdam, specializing in the development of explainable and responsible AI systems. He earned his Ph.D. from the ICT & Engineering department at the University of Naples, Italy, in 2023. Where, he focused on advancing inverse reinforcement learning and imitation learning in healthcare applications. Dr. Shah holds a master's degree from IIU Islamabad, Pakistan, where he was awarded a gold medal for his outstanding academic achievements. He is also an active member of professional organizations, including SIKS, SIE, IEEE, and ACM.

RESEARCH INTEREST

Explainable AI , Responsible AI, Deep Learning, Reinforcement Learning, Inverse Reinforcement Learning, Multi-model Learning, Imitation Learning, Heuristic Techniques, Time Series Analysis, Health care, Digital health, Data Science, Data Analytics, and Signals and Image Processing.

PROFESSIONAL EXPERIENCE

Postdoc Researcher

1-Sep-2023 - till

Vrije Universiteit Amsterdam (VU), De Boelelaan 1105, 1081 HV Amsterdam

✱ *Responsibilities included:*

- Develop Explainable, Maintainable, and Trustworthy Decision Support Systems for Personalised Care in Oncology.
- Supervise Bachelor & Master students and co-supervise Ph.D.
- Actively involved in project management through collaboration with other lab mates and industry partners.
- Work independently and collaboratively throughout the project implementation, including data extraction/preparation, design and implementation of scalable machine learning analysis and solutions, and documentation of results.
- Write up the results and publish them in reputed conferences or journals.

Researcher

1-Nov-2019 - 31-Aug-2023

Institute of High-Performance Computing and Networks (ICAR), National Research Council (CNR), Napoli, Italy

✱ *Responsibilities included:*

- Conduct a specified research program and collaborate with other lab mates and industry partners.
- Work independently and collaboratively throughout the project implementation, including data extraction/preparation, design and implementation of scalable machine learning analysis and solutions, and documentation of results.
- Conducted in-depth research utilizing various machine learning techniques i.e. Deep learning, Reinforcement learning and Inverse reinforcement learning.
- Apply Machine Learning techniques to IoT, Image processing and Healthcare fields and Identify solutions.

- Write up the results and publish them in reputed conferences or journals.

Visiting PhD Researcher (Internship)

25-Jan-2021 - 30-Nov-2022

Department of Mathematics and Computer Science, Eindhoven University of Technology, Netherlands

✱ *Responsibilities included:*

- Conducting research and investigating the process for risk management system inside of the Nuclear Medicine Department (NMD).
- Apply statistical, mathematical, and computational techniques to analyze or synthesize study data.
- Investigate the process, specifically, the performance of the experiments.

Junior Lecturer

1-Sep-2018 - 30-Oct-2019

Faculty of Engineering and Computer Science, National University of Modern Languages, Islamabad, Pakistan.

✱ *Responsibilities included:*

- Planning teaching, including lectures, seminars/tutorials and learning materials for undergrad students.
- Meeting students individually to discuss progress.
- Checking and assessing students' work.

Teacher Assistant

12-Oct-2015 - 31-Aug-2018

Faculty of Engineering and Computer Science, National University of Modern Languages, Islamabad, Pakistan.

✱ *Responsibilities included:*

- Laboratory equipment and experiment demonstrations for different electronics and programming subjects.
- Supervise semester projects of the undergraduate students.
- Help teachers to plan learning activities and complete records.
- Conducting research and writing conclusions

ADMINISTRATIVE RESPONSIBILITIES

- Program Committee Member of RespAI-HealthInfo conference 2026.
- Organized two time, 2-days research activities for L&R group at VU Amsterdam.
- Member of Host Organising Committee of UAI2022 conference at TUE Netherlands.
- Assistant Coordinator for the departmental visit of Pakistan Engineering Council (2018-2019) for accreditation of Engineering program at NUML University.
- Open House committee member at NUML University Islamabad 2018.
- Secretary for Numl Engineering Society (2017-2018).

EDUCATION AND TRAINING	PhD in Computer and Information Engineering 01-Nov-2019 - 15-May-2023. <i>Department of Information and Communication Technology & Engineering, at the The University of Naples(Italy).</i> * Fully Funded fellowship supported by the CNR, Italy. * Dissertation: <i>"Self-Learning Systems empowered by Inverse Reinforcement Learning"</i> * Advisor: Prof.Giuseppe De Pietro * Co-Advisors: Antonio Coronato MS in Electrical and Computer Engineering 1-Sep- 2016 - 30-Aug-2018 <i>IIU University, Islamabad, Pakistan</i> (4.0/4.0 CGPA)-Distinction * Thesis: "Extreme Learning Machine (ELM) Based Modulation Classification in Multipath Fading Channel" BS in Telecommunication Engineering 1-Jan-2010 - 30-Jan-2014 <i>Department of Engineering and Computer Science</i> (3.62/4.0 CGPA)-Distinction <i>NUML University, Islamabad (Pakistan).</i> * Thesis: "Modulation Classification using Cyclostationary Features on Fading Channels"
AWARDS AND HONOURS	* Merit-based scholarship for Top Students * Gold medalist in MS degree * Gold medalist in BS degree
CAD SKILLS	Machine Learning Techniques: Reinforcement Learning, Inverse Reinforcement Learning, Imitation Learning, Responsible AI, Deep Learning, Explainable AI, Random Forest, Decision Tree, Neural Networks. Data & Engineering: MLOps, Data processing and Analysis, Experiment Versioning, logs writing, pipeline building, Time-Series Analysis, Image & Signal Processing, Scalable ML Pipelines Programming Languages: Python, C, C++, Matlab, R, LabView Libraries & Tools TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, OpenCV, DVC, CI/CD, MLflow, Git, GitHub, Docker, LaTeX, Kubernetes Research writing & Management Tools: LATEX, Microsoft, BibTex, EndNote, and Mendeley, project management
TALKS	* Delivered a talk on "Interpreting Model-agnostic Black-box Explanation Techniques" at AI in Healthcare seminar at VU Amsterdam. * Presented my paper titled "Evaluation of Model-agnostic explanation techniques on healthcare dataset" at HealthInf conference 2025. * Presented my work at KU leuven Belgium during research visit. * Poster presentation at BNAIC-2025 conference. * Presented my work on "Inverse Reinforcement learning for Dynamic treatment Regime" at PersOn project consortium meeting at Nijmegen, Netherlands.
TEACHING	* AI in Health: BS(AI) course at Vrije Universiteit Amsterdam, Netherlands , (Spring 2025, Spring 2026) * Machine Learning: Graduate courses at the University of Naples, Italy. (Fall 2022) * Intelligent Signal Processing : Graduate courses at the University of Naples, Italy. (Fall 2022)

	* Digital Signal Processing: Bachelor course, NUML University, Islamabad, Pakistan. (<i>EEDS-361</i>) Fall 2018, spring 2019 * Digital Image Processing: Bachelor course, NUML University, Islamabad, Pakistan. (<i>EEDI-362</i>) Spring 2017, Fall 2018 * Software Packages (MATLAB/ Python/ LABVIEW): Bachelor course, NUML University, Islamabad, Pakistan. (<i>MTSO-209</i>) Fall 2017, Spring 2018
WORKSHOPS AND SUMMER SCHOOLS	* Bumblekite MLSS Attended Bumblekite machine learning summer school in healthcare biosciences (Bumblekite MLSS) at ETH Zürich, Switzerland. * DeepLearn 2021 Participated in DeepLearn 2021 Summer, at Las Palmas de Gran Canaria, Spain. * SSIE 21 Attended IEEE/DEI Summer Ph.D. School of Information Engineering at University of Padova, Italy. * SeLIE'21 Attended International Workshop on Self-Learning in Intelligent Environments, at Dubai, United Arab Emirates.
PROFESSIONAL AFFILIATIONS/ MEMBERSHIPS	* Netherlands Research School for Information and Knowledge Systems (SIKS) * Member, Association of Computing Machinery (ACM) * Member IEEE * Membership of Pakistan Engineering Council(PEC)
PROFESSIONAL VOLUNTARY CONTRIBUTIONS	* Reviewer of a number of renowned journals including: Journal of Reliable Intelligent Environments, IEEE Access, Elsevier, Springer Nature. * Organizer for group outing and research visits for L&R group at VU Amsterdam.
RESEARCH STATISTICS	Total Number of Publications : 14 Cumulative Google Citation: 154 h-index: 7 Research Interest Score: 50+ List of publications: https://orcid.org/0000-0002-6390-1864
KEY PUBLICATIONS	* Shah, S.I.H., ten Teije, A. and Volders, J., Can We Trust Explanation! Evaluation of Model-Agnostic Explanation Techniques on Highly Imbalanced, Multiclass-Multioutput Classification Problem. * Shah, S.I.H.; Naeem, M.; Paragliola, G.; Coronato, A.; Pechenizkiy, M. An AI-empowered infrastructure for risk prevention during medical examination. Expert Systems with Applications 2023, p. 120048. doi: https://doi.org/10.1016/j.eswa.2023.120048. (SCIE, IF: 8.669) * Shah, S.I.H., De Pietro, G., Paragliola, G. and Coronato, A., 2022. Projection-based inverse reinforcement learning for the analysis of dynamic treatment regimes. Applied Intelligence, pp.1-13.(SCIE, IF: 5.019) * Shah, S.I.H., Coronato, A., Naeem, M. and De Pietro, G., 2022. Learning and Assessing Optimal Dynamic Treatment Regimes Through Cooperative Imitation Learning. IEEE Access, 10, pp.78148-78158.(SCIE, IF: 3.367) * Shah, S.I.H., Coronato, A., Ghauri, S.A., Alam, S. and Sarfraz, M., 2022. CSA-Assisted Gabor Features for Automatic Modulation Classification. Circuits, Systems, and Signal Processing, 41(3), pp.1660-1682.(SCIE, IF: 2.311)

- * **Shah, S.I.H.**, Alam, S., Ghauri, S.A., Hussain, A. and Ansari, F.A., 2019. A novel hybrid cuckoo search-extreme learning machine approach for modulation classification. *IEEE Access*, 7, pp.90525-90537. **(SCIE, IF: 3.367)**
- * **Shah, S.I.H.** and De Pietro, G. An Overview of Inverse Reinforcement Learning Techniques. In *Intelligent Environments 2021: Workshop Proceedings of the 17th International Conference on Intelligent Environments* (Vol. 29, p. 202). IOS Press.
- * Khan, A.F., Jalil, A., Haq, I.U. and **Shah, S.I.H.**, 2021, June. Automatic Localization of Macula and Identification of Macular Degeneration in Retinal Fundus Images. In *2021 International Conference on Electrical, Communication, and Computer Engineering (ICECCE)* (pp. 1-6). IEEE.
- * **Shah, S.I.H.** and Coronato, A., 2021, June. Learning Tasks in Intelligent Environments via Inverse Reinforcement Learning. In *2021 17th International Conference on Intelligent Environments (IE)* (pp. 1-4). IEEE.
- * **Shah, S.I.H.** and Coronato, A., 2021. Inverse Reinforcement Learning Through Max-Margin Algorithm. In *Intelligent Environments 2021: Workshop Proceedings of the 17th International Conference on Intelligent Environments* (Vol. 29, p. 190). IOS Press.

REFERENCES

- * **Prof. dr. Annette ten Teije**
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- * **Prof. Antonio Cronato**
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- * **Dr. Muddasar Naeem**
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