MD IMBESAT HASSAN RIZVI

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EMPLOYMENT

Robert Bosch Centre for Cyber-Physical Systems, Indian Institute of Science (IISc) *Oct 2020 – Present*
- ■ *Technical (Research) Associate*

- Worked on Human-Robot Interaction (HRI) for social robots. Enabled (i) two-way remote speech communication with phoneme segmentation based lip synchronization and (ii) Wav2Vec2 based speech to text conversion followed by NLP based action identification and execution on social tele-robot *"Asha"*.

- Part of the work is open sourced as *sonorus* pypi package. Our team *"Aham"* (Asha) is one of the finalists in the *International Conference on Social Robotics (ICSR), 2021 (Competition track)* and is among the thirty eight semi-finalists in the *ANA Avatar XPRIZE competition*.

- Worked on the bio-medical "MIMICause" dataset creation for causal relation extraction and trained baseline BERT and Clinical-BERT based models for relation classification with an F1 score of 0.56 in a nine-class classification.

- Working on context-based GCN classifier augmented BERT model for improving classification task performances of language models.

- Working on multi-modal learning (vision and language) for enabling language (NLP) based instruction execution through reinforcement learning (RL).

Hewlett-Packard (HP) Inc. *Jul 2017 – Oct 2020*
- ■ *Senior Machine Learning Engineer (Data Scientist III)* *Nov 2019 – Oct 2020*
- ■ *Machine Learning Engineer (Data Scientist IIIA)* *Jul 2017 – Oct 2019*

- *Printer part failure prediction for minimal intervention cost* – We introduced sequence-based definition of precision and recall specific to the class of problems for intervention along with an LSTM based learning procedure using multiple-instance learning based hybrid loss.

- *Identifying the relative importance of customer issues on product ratings* – Used self-attention based LSTM network to identify key phrases within a customer review followed by identifying the overall importance of these phrases in determining product ratings.

EDUCATION

Indian Institute of Science (IISc), Bangalore
- ■ *Reinforcement and Deep Reinforcement Learning (3:0 Credits) – A+* *Aug 2021 – Dec 2021*
- ■ *M.Tech from the Department of Computational and Data Sciences (CDS) – (CGPA : 6.1 / 8.0)* *Jul 2015 – Jun 2017*

Thesis work – on combinatorial approaches to non-isomorphic graph generation of potential drug molecules by preserving local information-theoretic indices of activity linked nodes in molecular graphs, and chemical properties prediction of hydrocarbons. Project funded by departments under *Ministry of Science & Technology, Government of India (GoI)*.

Indian Institute of Technology - IIT (ISM), Dhanbad *Jul 2008 – Jun 2012*
- ■ *B.Tech in Mechanical Engineering – (CGPA : 7.83 / 10.0)*

Senior year project – developed a mathematical model for thermal properties of nano-fluids based on a linear conductivity gradient across the interfacial layer between the nano-particles and the base fluid, and solving the resulting steady state heat conduction differential equation.

ONLINE COURSES

Acalonia School *Apr 2019 – Mar 2020*
Formerly kown as *Tokyo Data Science (TokyoDS)*
- ■ *Deep Learning and Data Science Track*

Topics include – Mathematics for machine learning, gradient based optimization techniques, computer vision (CV), natural language processing (NLP), reinforcement learning (RL), generative adversarial networks (GANs), variational autoencoders (VAEs) and causal inference.

PUBLICATIONS

⅋ Google Scholar Profile

Conference Papers

- Vivek Khetan[*], **Md Imbesat Hassan Rizvi**[*], Jessica Huber, Paige Bartusiak, Bogdan Sacaleanu and Andrew Fano. **MIMICause: Representation and automatic extraction of causal relation types from clinical notes.** In *Findings of the Association for Computational Linguistics: ACL 2022*, pages 764-773, Dublin, Ireland. Association for Computational Linguistics.

- Himanshu Tiwari, Shameed Sait, **Md Imbesat Hassan Rizvi** and Niranjan Damera-Venkata. **Identifying the Relative Importance of Customer Issues on Product Ratings through Machine Learning.** In *Proceedings of the ACM Symposium on Document Engineering 2018 (DocEng '18).*

Journal Papers

- Adrian Ahne, Vivek Khetan, Xavier Tannier, **Md Imbesat Hassan Rizvi**, Thomas Czernichow, Francisco Orchard, Charline Bour, Andrew Fano and Guy Fagherazzi. **Identifying causal relations in tweets using deep learning: Use case on diabetes-related tweets from 2017-2021.** *JMIR Medical Informatics* (Accepted, to be published soon).

- Chandan Raychaudhury, **Imbesat Hassan Rizvi** and Debnath Pal. **Predicting gas phase entropy of select hydrocarbon classes through specific information-theoretical molecular descriptors.** *SAR and QSAR in Environmental Research.* Taylor & Francis. Vol. 30, Issue 7, pp. 491–505, 2019.

- **Imbesat Hassan Rizvi**, Ayush Jain, Subrata Kr. Ghosh and P. S. Mukherjee. **Mathematical modelling of thermal conductivity for nanofluid considering interfacial nano-layer.** *Heat and Mass Transfer.* Springer-Verlag. Vol. 49, Issue 4, pp. 595–600, 2013.

Book Chapters

- **Md. Imbesat Hassan Rizvi**, Chandan Raychaudhury and Debnath Pal. **Combinatorial Drug Discovery from Activity-Related Substructure Identification.** In: Mohan C. (eds) *Structural Bioinformatics: Applications in Preclinical Drug Discovery Process.* Challenges and Advances in Computational Chemistry and Physics. Springer, Cham. Vol. 27, pp. 71–108, 2019.

TUTORING, SERVICES AND VOLUNTEERING

- *Teaching Assistant*, Computational Data Science, Indian Institute of Science (IISc) *July 2021 – Present*
- *Reviewer*, ML Reproducibility Challenge 2020 *Feb 2021 – Mar 2021*
- *Grading & Master's Thesis Supervision Assistantship*, UpGrad Education Pvt. Ltd. *Oct 2020 – Present*
- *Volunteer*, International Conference on Learning Representations (ICLR) *Apr 2020*

TECHNICAL SKILLS

Programming:	Python, Java, C++, Matlab, CUDA, MPI, Open-MP
Software & Frameworks:	PyTorch, Keras, Hugging Face, Ray[rllib], Robot Operating System (ROS), Docker, Scikit-Learn, XGBoost, Flask

SCHOLARSHIPS, HONOURS AND ACHIEVEMENTS

Scholarships

- *Graduate Student Scholarship, Indian Institute of Science (IISc), Bangalore* *Jul 2015 – May 2017*
- *Merit-cum-means Scholarship, Indian Institute of Technology – IIT (ISM), Dhanbad* *Jul 2008 – May 2012*

Honours and Achievements

- *Secured rank of 99 (top 0.06 percentile) in the all India Graduate Aptitude Test in Engineering (GATE) which is a test for country-wide admissions to graduate engineering programs in India.* *Mar 2013*
- *2nd Prize recipient, Poster Competition, Society of Petroleum Engineers (SPE), Bangalore Section* *Sep 2009*
- *Secured a position among the top 2 percentile in the Indian Institute of Technology (IIT) entrance examination which is conducted country-wide for undergraduate admissions to prestigious IIT(s).* *Jun 2008*
- *Amul Vidya Bhushan Award – by Amul Foundation for academic excellence* *Jun 2008*
- *Hindustan Pratibha Samman – by HT Media Ltd. for academic excellence* *Jun 2008*
- *Secured an All India Rank of 131 (top 6 percentile) in National Science Olympiad (NSO)* *2003*

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[*]Equal contribution