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*

  - Working 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 and *imperio* github repository.
  - 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***.
  - Working towards 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.*

*Equal contribution

- 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

- 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.
- Chandan Raychaudhury, **Md. Imbesat Hassan Rizvi** and Debnath Pal. **Combinatorial Design of Molecule using Activity-Linked Substructural Topological Information as Applied to Antitubercular Compounds.** *Current Computer-Aided Drug Design.* Bentham Science. Vol. 15, Issue 1, pp. 67–81, 2019.
- Ayush Jain, **Imbesat Hassan Rizvi**, Subrata Kumar Ghosh and P.S. Mukherjee. **Analysis of nanofluids as a means of thermal conductivity enhancement in heavy machineries**, *Industrial Lubrication and Tribology*, Emerald Group Publishing. Vol. 66, No. 2, pp. 238–243, 2014.
- **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.

In Review

- Adrian Ahne, Vivek Khetan, Xavier Tannier, **Md Imbesat Hassan Rizvi**, Thomas Czernichow, Francisco Orchard, Charline Bour, Andrew Fano and Guy Fagherazzi. **Identifying causal associations in tweets using deep learning: Use case on diabetes-related tweets from 2017–2021.** arXiv:2111.01225 [cs.CL]

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, 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*
- 2^{nd} *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*