Apoorva V. **Singh**

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Education

National Institute of Technology Silchar, India — *Overall GPA: 7.85*

Bachelor of Technology in Electrical Engineering — *Aug. 2017 - June. 2021 (Expected)*

City Montessori School, Lucknow, India — *Percentage: 92.6%*

Intermediate Science (Physics, Chemistry, Mathematics) — *May. 2014 - June. 2016*

Experience

Massachusetts Institute of Technology — *Cambridge, United States*

Research Intern — *Dec. 2020 - Present*

- Working under Prof. George Em Karniadakis and Dr. Mengjia Xu
- Working on dynamic functional brain network analysis for Alzheimer's disease prediction using "dynamic graph embedding'' method

Max Planck Institute for Dynamics of Complex Technical Systems — *Magdeburg, Germany*

Guest Researcher — *Jun. 2020 - Present*

- Working under Prof. Peter Benner and Dr. Pawan Goyal in the research group Computational Methods in Systems and Control Theory.
- Working on methods of inverse imaging problems using deep learning.

University of Hyderabad — *Hyderabad, India*

Undergraduate Research Intern — *May. 2019 - July. 2019*

- Worked in Artificial Intelligence (AI) Laboratory, UoH, under Prof. Atul Negi, School of Computer and Information Sciences.
- Worked on developing efficient drug repositioning techniques by using ontological medical data and medical text corpus

Roghaari — *Silchar, India*

Machine Learning Engineer — *Dec. 2017 - Aug. 2018*

- Worked to develop a deep learning based engine that analysed the client's monthly health data to anticipate any health risks.
- The data was collected through wearables and uploaded on monthly basis to a cloud server.

Key Projects

Towards Better Drug Repositioning Using Joint Learning — *May. 2019 - Jun. 2019*

Guide: Prof. Atul Negi — *Link to the Paper*

- Devised a novel technique to harvest a semantic biological knowledge graph constructed using multiple biological ontologies.
- Utilized semantics from aforementioned knowledge graph to complement medical literature Medline corpus (PubTator project) for improved drug repositioning.

CredCheck: Debunking Fake News by Leveraging Speaker Credibility and BERT — *May. 2019 - Aug. 2019*

Guide: Dr. Thoudam Doren Singh — *Link to Project*

- Re-engineered Google's BERT embeddings on LIAR dataset for multi-class classification task of Fake news detection.
- Used multimodal data to leverage speaker's personal specifics and his/her credibility to rate the legitimacy of the statement.
- Used refocusing mechanisms to further refine the results to achieve state-of-the-art results.

A Hybrid Classification Approach using Topic Modeling and Graph Convolution Networks

July. 2019

Guide: Dr. Thoudam Doren Singh

Link to Project

- Constructed a structured heterogeneous text corpus graph to transform text classification problem into a node classification problem.
- Created semantic rich features by using Text GCN and topic modeling based approach-LDA which are then fed into a novel classification model.

Electronic Health Record (EHR) based Patient Case Similarity

Mar. 2019

Problem statement by eZDI, inc.

Link to Project

Presented in Grand Finale of Smart India Hackathon organized by MHRD India

- Calculation of Patient Similarity based on Patient Demographic and Case Details extracted from XML annotations in Electronic Health Records (EHR).
- XSLT used for transforming and extracting annotated data into CSV.
- An ensemble model consisting of both Word Mover's Distance (WMD) and General Feature Extraction based on curated list of important sections weighted in the ratio 3:1.

Predictive Approaches for the UNIX Command Line

Sep. 2018 - Dec. 2018

Guide: Dr. Thoudam Doren Singh

Link to Project

- Developed a self-curated knowledge base for all the commands presents in UNIX.
- Integrated information from the knowledge graph with UNIX data considering contextual knowledge they possess.
- Used a Seq2Seq architecture to harvest sequential intelligence of data to achieve a state-of-the-art results in predicting next command for given 'n' previous commmands.

Publication

Apoorva Vikram Singh, Atul Negi. "Towards better Drug Repositioning using Joint Learning". *2019 IEEE 16th India Council International Conference (INDICON)*

Apoorva Vikram Singh, Thoudam Doren Singh, Divyansha, Abdullah Khilji. "A Hybrid Classification Approach using Topic Modeling and Graph Convolution Networks" *International Conference on Computational Performance Evaluation (ComPE). IEEE, 2020.*

Apoorva Vikram Singh, Thoudam Doren Singh, Divyansha, Anubhav Sachan, Abdullah Khilji. "Debunking Fake News by Leveraging Speaker Credibility and BERT" *Accepted at IEEE/WIC/ACM International Joint Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT'20)*

Apoorva Vikram Singh, Thoudam Doren Singh, Abdullah Khilji, Divyansha, Surmila Thokchom, Sivaji Bandyopadhyay. "Predictive Approaches for the UNIX Command Line: Curating and Exploiting Domain Knowledge in Semantics Deficit Data" *Multimedia Tools and Applications, Springer*

Key Courses Undertaken

Computer Science: Deep learning (5 course specialization by deeplearning.ai on Coursera) , Machine Learning (Course by Stanford on Coursera), Data Structures and Algorithms (NPTEL), Introduction to Machine Learning (NPTEL), Signals and Systems.

Mathematics and Statistics: Calculus, Linear Algebra, Differential Equations, Probability and Statistics.

Academic Achievements

2020	**Runner up at the Crystal Ball 2020 Hackathon** for the problem statement Demonstrate that a Distributed Supply Chain Problem can be Managed by Co-Operating AI Agents	*Blue Yonder*
2020	**Acceped as a scholar Qubit by Qubit's Introduction to Quantum Computing**	*The Coding School and IBM Quantum*
2019	**Finalist in Smart India Hackathon organized by Ministry of Human Resource Developement**	*NIT Warangal*
2020	**Innovation and Entrepreneurship Development Centre (IEDC) Grant Winner** for the project "Deep Reinforcement Learning (DRL) Based Liquid Lens Auto-Focus system"	*NIT Silchar*
2020	**Undergraduate Research Council (UGRC) Grant Winner** for the project "AssistiveMRI: A deep learning approach to Medical Image Processing"	*NIT Silchar*
2020	**Winner of Data Strata, Tecnoesis' 20** for the problem statement "Analysis of Global Terrorism Events"	*NIT Silchar*
2019	**Winner of Data Strata, Tecnoesis' 19** for the problem statement "What is the best approach to become a Data Scientist"	*NIT Silchar*

Technical Strengths

Computer Languages	Python, MATLAB, Java, C/C++, Assembly
Software and Tools	Latex, Git, Vim
Scripting and Query Languages	PHP, JQuery, MySql, MongoDB
Data Analysis, ML, DL	Keras, Pytorch, Tensorflow, scikit-learn, NLTK, OpenCV