RUPALI BHATI

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WORK EXPERIENCE

Freelancer Feb 2019 - present

[RL, DRL]

- Currently working on applying Deep Q-Learning (DQN) to continually increase account equity for trading in the Foreign Exchange Market
- At Bert Labs, applied reinforcement learning (RL) to increase the energy efficiency of a Heating-Ventilation and Air-Conditioning system. For a leading global FMCG company's headquarters building, using DQN, increased efficiency of their Air-Handling Unit system by over 70% as compared to classical proportional-integral-derivative logic.
- Conducted a week long workshop to teach fundamentals of RL to employees at Adventum. Assisted them with application of RL to improve segmentation in medical images.

Codementor Aug, 2019 - present

Mentor *[ML, RL, DRL]*

- Currently teaching fundamentals of RL to multiple graduate students and working professionals. Have worked with over 20 mentees so far.
- Assisted a student from American University in Cairo to implement a Cognitive Radio System in a stochastic environment using Q-learning and DQN. Our solution showed 10% higher throughput on average as compared to classical techniques.

UpGrad - An Online Education Platform Sep, 2018 - Jan, 2019

Xpert (Domain expert) *[RL, Deep RL]*

- Independently formulated and developed an end-to-end solution using Q-learning as well as DQN for a model inventory management problem. Results showed that the predicted order size matched the mean demand of the next-to-next day. Improved the results of the DQN algorithm using replay memory, prioritised sweeping & Double-DQN (DDQN).
- Designed assignments on dynamic programming, Monte Carlo methods & temporal difference learning
- Mentored students by taking TA sessions on RL

Indraprastha Institute of Information Technology - Delhi Sep, 2017 - Aug, 2018

Research Assistant (Advisor - Dr.Saket Anand) *[RL]*

- Trained an autonomous vehicle to learn optimal behaviour using Q-learning. The vehicle demonstrated the ability to smartly adapt communications and planning actions, while achieving large driving utilities. This work was published at IEEE Intelligent Transportation Systems Conference (ITSC), 2018.
- Learned in detail about dynamic programming, POMDPs, Monte-Carlo methods, function approximators and DDQN

Coding Blocks Jun, 2018 - Jul, 2018

Teaching Assistant *[ML,DL,RL]*

- Assisted undergraduate and graduate computer science engineering students at the 'Advanced ML & AI' classroom course with hands-on training of algorithms like decision trees, auto-encoder, recurrent neural networks, long-short term memory, etc. and projects like text generation and face-detection (https://github.com/RupaliBhati/Perceptron_Summer_Noida_2018)
- Taught lectures on Introduction to RL, principal component analysis, linear algebra, logistic regression, etc. to the 35+ students

KPMG Jun, 2016 - Aug, 2017

Data Analyst *[Data Analysis, RL]*

- In collaboration with Microsoft, developed an algorithm using policy iteration for automating 'Dynamic Pricing of Tickets' to maximise revenue. Implemented the same using python, R and SQL. Successfully indicated increase in revenue and helped reduce human effort by upto 70-80%.
- Researched use cases of predictive and descriptive analytics to provide business insights to various government organisations which helped them automate processes and boost efficiency

PUBLICATIONS AND PEER REVIEW

- Mayank K. Pal, **Rupali Bhati**, Anil Sharma, Sanjit K. Kaul, Saket Anand and P.B.Sujit - 'A Reinforcement Learning Approach to Jointly Adapt Vehicular Communications and Planning for Optimized Driving'. *Published at IEEE ITSC, 2018.* (https://ieeexplore.ieee.org/abstract/document/8569484)
- Reviewer for IEEE ITSC, 2018.

EDUCATION

Delhi Technological University, New Delhi, India *2012 - 2016*
Bachelor of Technology - Electronics and Communication
Aggregate - 72.29% (WES equivalent 3.55/4.0). Awarded First Class.
Final year project - Designed an ultra-low cost smart battery management system for electric vehicles (rickshaws), which was later used by a Chinese company for smart battery charging.

Reinforcement Learning Summer School, Lille, France (https://rlss.inria.fr) *July, 2019*
Discovered the theory and practice of multi-arm bandits, dynamic programming, temporal difference learning and deep reinforcement learning.

Advanced Machine Learning and Artificial Intelligence Course, Coding Blocks *Jan 2017 - April 2017*
Completed Perceptron - a course on fundamentals of machine learning including hands-on training. Studied concepts of regression, random forests, neural networks, natural language processing, reinforcement learning, etc.

PROGRAMMING LANGUAGES & TOOLS

- Python: PyTorch, Keras, TensorFlow
- SQL, SQL Server Management Studio
- LaTeX
- R
- MATLAB
- Tableau

INTERNATIONAL EXPERIENCE

- Attained **Level A1 in French** (Certified by McGraw Hill Education)
- One of the 35 delegates at ASES Entrepreneurial Summit at **Stanford University** (*April, 2016*)
- As Vice-President and Head of Electronics at Team DTU Supermileage, represented the team at Shell Eco-Marathon Asia at Manila, Philippines. The team stood in the **top 10** in its category. (*February, 2016*)
- Schooling from U.S.A., Slovakia, Mauritius and India

EXTRA-CURRICULAR ACTIVITIES

Captain, IIITD Basketball Team *2017 - 2018*

Captain, DTU Basketball Team *2015 - 2016*

SOCIAL RESPONSIBILITY

Volunteer, Kisan Majdur Aadrash Inter Enter Higher Secondary School *2016 - present*

Founder and President, Women in Science and Engineering (WiSE) - DTU *2015 - 2016*