Sajal Goyal

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Educational Qualifications

Year	Degree/Certificate	Institute	CGPA/%
2018 - Present	B.Tech	Indian Institute of Technology Kanpur	8.2/10
2018	CBSE – XII	Kautilya Sr. Sec. School, Kota	89.8%
2016	ICSE – X	St. Peter's College, Agra	95.3%

Honors and Achievements

- Secured **1st** position in **FinFest Pan IIT Equity Portfolio Management** competition, with **1000**+ participants
- Secured **1st** position in **Stock the Stock** competition by Entrepreneurship Cell, IIT Kanpur with **150**+ participants
- Secured **27th** position in **Data Science Hackathon**, organised by **Trell** with **2000+** participants
- Secured **All India Rank 1981**, JEE Advanced 2018 amongst 160,000 candidates

Key Projects

Tweet Sentiment Extraction

Science and Technology Council, IIT Kanpur May'20 - Jul'20

- Built **NLP model** which takes Tweet and Sentiment as input and outputs Part of Tweet which represents that Sentiment
- Performed **Exploratory Data Analysis** and Stacked some layers on top of **RoBERTa** to increase robustness of the model
- Applied **StratifiedKFold cross validation** to reduce overfitting and post-processed the output to increase accuracy

Autonomous Underwater Vehicle

Mentor: Prof. Mangal Kothari May'19 - Mar'20

- Implemented **Detection** and **Tracking** Algorithm to detect complex objects and their centre under water using **OpenCV**
- Created **multi-class labelled underwater dataset** for training the State of the Art real time object detection system
- Tweaked the vision layer in the codebase to perform image processing tasks while improving its robustness

Self-Driving Vehicle Simulation

Mentor: Prof. Venkatesan Kanagaraj Jan'20 - May'20

- Pre-processed the **Point cloud** data, collected by Velodyne's Puck lidar sensor(VLP-16), in MATLAB to remove invalid points
- Implemented code to differentiate ground points while getting bounding boxes of different objects by **DBSCAN** algorithm
- Implemented robust tracking using **Kalman filter** which optimally estimates the current state of the surrounding objects

Playing Atari with Reinforcement Learning

Science and Technology Council, IIT Kanpur May'20 - Jul'20

- Implemented **Reinforcement Learning** algorithm for **Markov Decision Process** with raw pixels of current state as input
- Incorporated **Experience replay** to reduce overfitting thereby smoothing out and speeding up the training process time
- Trained the **Deep Q-network** model for **10+ hours** on the cloud which reached Human level accuracy on an average

Research Experience

Changing the Game: The Rise of Sports Analytics

Mentor: Prof. Faiz Hamid Jan'21 - Mar'21

*Research paper going to be published in **Journal of Sports Sciences***

- Reviewed literature on **Data Analytic** techniques in Football to **Predict Match Outcome** with critical analysis of **16** papers
- Explored various **State Of The Art** techniques and analysed their trends over years with **Stacked Histogram**
- Classified papers based on their Objectives and examined the popular and most **relevant variables** for predicting results

Positions of Responsibility

Software Team Head *Science and Technology Council*

Team AUV-IITK Apr'20 - Mar'21

- Spearheaded a group of **7 people** working on Autonomous Vehicle's software, planning and implementing technical changes
- Maintained **software stack** of Autonomous Vehicle, developed using ROS, OpenCV and UnderWater SIMulator, on **Github**
- Represented team at various exhibitions to share our experience with others and Performed administrative and managerial tasks

Skills

Data Science: SQL, Tensorflow, Keras, Pandas, Scikit-learn, Numpy, Matplotlib
Programming Languages: Python, C, C++
Robotics: ROS, OpenCV
Utilities: Git, LaTeX, MATLAB, Excel, Fusion 360

Relevant Coursework

Applied Probability & Statistics
Computational Methods in Engineering
Linear Algebra and Ordinary Differential Equation
Fundamentals of Programming
Convolutional Neural Networks*(o)*
Real Analysis & Multivariate Calculus

(o) : Online Course