Sajal Goyal

Fourth Year Undergraduate,
Department of Chemical Engineering

sajalg@iitk.ac.in | sajalgoyal113.github.io
sajalgoyal113 | sajalgoyal113

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 the **FinFest Pan IIT Equity Portfolio Management** competition 2021 with **1000**+ participants
- Secured **1st** position in **Stock the Stock** competition 2020 by Entrepreneurship Cell, IIT Kanpur with **150**+ participants
- Amongst **Top 3** in Round 1 and Overall **Top 30** in **Data Science Hackathon** organised by **Trell** with **2000+** participants
- Secured **All India Rank 1981** in JEE Advanced 2018 amongst 160,000 candidates

Professional Experience

KPIT Technologies | Data Science Intern *May'21 - Jul'21*

Objective	• Deliver an unsupervised **Anomaly Detection** model for real time **health monitoring** of the **engine oil**
Strategy	• Applied LOWESS smoothing on the data of 16 sensors to remove noise and increase efficiency of algorithms • Performed unsupervised **feature selection** using **Deep Neural Network** and bountiful visualizations • Developed **temporal probabilistic** failure prediction model using **Autoencoders** with **<10%** false alarm
Impact	• Achieved **85% recall** on predicting anomalies in engine oil cycle and **<5% reconstruction error** mean

Research Experience

Changing the Game: The Rise of Sports Analytics (*Mentor: Prof. Faiz Hamid*) *Jan'21 - Aug'21*

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

- Reviewed **sports analytics** work for **decision making** with **16** critically analyzed papers selected using **PageRank** algorithm
- Employed **Network analysis** on bibliometric data of **127 research papers** to investigate the emerging areas of interest
- Explored **State-of-the-Art** techniques in Football analytics and studied the past 20 years trend with **stacked histogram**

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 the tweet which represents that sentiment
- Performed **Exploratory Data Analysis** and stacked **5 layers** on top of **RoBERTa** to increase robustness of the model
- Integrated a **5-fold cross validation** using **stratified** sampling to reduce overfitting and accomplished **0.715 jaccard score**

Autonomous Underwater Vehicle (*Mentor: Prof. Mangal Kothari*) *May'19 - Mar'20*

- Designed **detection** and **tracking** algorithm to detect complex objects and their center 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 complete **image processing** tasks meticulously 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 algorithm to differentiate ground points while getting bounding boxes of different objects by **DBSCAN** algorithm

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 and reached human level accuracy with **10+ hours** of training

Skills

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

Positions of Responsibility

Software Team Head (*Team AUV*) *Apr'20 - Mar'21*

- Spearheaded a group of **7 people** working on Autonomous Vehicle's software, planning and implementing technical changes
- Represented team at various exhibitions to share our experience with others and handled administrative and managerial tasks

Relevant Coursework

Introduction to Machine Learning
Applied Probability & Statistics
Data Mining & Knowledge Discovery
Computational Methods in Engineering
Fundamentals of Programming
Operations Management