

# Prasenjeet Roy

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RESEARCH INTERESTS Machine Learning, Deep Learning, Natural Language Processing

EDUCATION **Indian Institute of Technology(IIT)**, Jodhpur, Rajasthan, India  
MTech, Artificial Intelligence, 2021 (8.29 CGPA)

**G. H. Raison College of Engineering**, Nagpur, India  
B.E., Computer Science and Engineering, May, 2018 (9.83 CGPA)

ACADEMIC EXPERIENCE **Indian Institute of Technology(IIT)**, Jodhpur, Rajasthan India  
*Post-Graduate Student* **August, 2019 - 2021**  
Includes current M.tech. research, and Masters level coursework and research projects.

*Research Scholar* **September, 2019 - present**  
Duties included shared administrative responsibilities with faculty instructor, solving all student queries, and taking weekly computer lab exercises

WORK EXPERIENCE **TCS RnD**, Delhi  
*NLP engineer intern* **May, 2022 - present**  
Designing a multi-document focused abstractive summarization of documents

**Flandez Software Solutions**, Jamshedpur, India  
*Python Developer* **June, 2018 - July, 2019**  
Designing an aspect based sentiment analyser to detect aspects and their sentiments from respective reviews. The problem sub-divided into two tasks - a) Aspect detection and classification from a review, and, b) Sentiment classification for the extracted aspects of the reviews.

**Hind Softwares Pvt. Ltd.**, Nagpur, India  
*Android Developer Intern* **Nov, 2017 - Apr, 2018**  
Designed an android app that contains web-apps for shopping, travel bookings, restaurants and many more. This way it would have a single account to manage all the apps and also memory efficient.

**Infocepts**, Nagpur, India  
*Data Analyst Intern* **May, 2017 - Aug, 2017**  
Designed a dashboard on petroleum analysis using MicroStrategy and received the recognition for the best project.

PUBLICATIONS •Prasenjeet Roy, Suman Kundu, Review on Query focused Multi-Document Summarization (QMDS) with Comparative Analysis, **ACM-CSUR, 2021** (Impact Factor: 10.282) (in review)

PROJECTS **COVID-19 Helpline Chatbot**  
Natural Language Processing, May 2020

- Used RASA 2.0, an open source toolkit for chatbot design
- Perform data-augmentation by web-scraping related answers from google search

### **Rudimentary Question-Answering System**

Natural Language Processing, April 2020

- Developed a QA system using BERT pre-trained models
- Trained the model on SQuAD 2.0 dataset and Finetuned on the COVID-19 question-answers

### **News Sentiment Classifier**

Natural Language Processing, March 2020

- Developed a Deep Learning based sentence level sentiment classification tool using Attention Networks
- Designed a crawler that gather News articles from Livemint International section for classifying every sentence as Positive / Negative.

### **Defence Against Adversarial Text Attacks**

Dependable AI, Course Project, Oct 2021

- Performed a systematic comparative study of SOTA adversarial attacks at word-level and character-level
- Developed an adversarial detection model for single word-level attacks
- Performed the study on sentiment dataset SST2 and classification dataset AG-NEWS dataset

### **Adversarial Attacks Detection, Defense and Mitigation**

Dependable AI, Sept 2021

- Performed both targeted and untargeted FGSM(Fast gradient sign Method), BIM attack and Jacobian-based saliency map approach attack on ResNet50 model trained from scratch on CIFAR10 dataset
- Analyzed the results based on accuracy, perturbation magnitude, and SSIM.
- Performed JPEG compression at two different compression rates to mitigate the attack.
- Performed UQI attack detection to detect adversarial attacks on CIFAR10 images.

### **Analyzing the Bias and Explainability for different ML algorithms**

Dependable AI, Aug 2021

- Performed classification on UTK Face dataset using LCNN model and linear SVM
- Evaluated the model on gender attribute for different race and age category.
- Analyze the bias results and mitigate the bias using focal loss in LCNN model
- Trained a VGG16 model from scratch on CIFAR10 dataset and evaluate performance on grayscale images
- Mitigated the bias with data and algorithmic methods
- Visualize the explainability of the model using GradCam and GradCam++ for correctly and incorrectly classified images

### **GDP and Stock Market Indices**

Machine Learning, Dec 2020

- Developed a model to predict the relation between GDP of the country and stock indices using different correlations.
- Predicted the GDP of the year 2020 based on the GDP of the last ten years and its comparison to the real GDP post-COVID pandemic.

- Analysed the relationship between GDP, per capita income year wise and employment data.
- Analysed the effect of COVID-19 on different GDP sectors like agriculture, manufacturing, and many more.

COURSE WORK • Machine Learning • Deep Learning • Natural Language Processing • Dependable AI • Artificial Intelligence

COMPUTER SKILLS • Languages: Python, SQL  
• Frameworks : Keras, Tensorflow 2 and PyTorch.  
• Packages: Numpy, Pandas, nltk, spacy  
• Applications: Docker, L<sup>A</sup>T<sub>E</sub>X, Kubernetes  
• Operating Systems: Unix/Linux, Windows