



SHREYA LADDHA

FINAL YEAR UNDERGRADUATE

IIT Bombay, India

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Education

Indian Institute of Technology, Bombay

B.TECH IN ELECTRICAL ENGINEERING WITH MINOR IN COMPUTER SCIENCE AND ENGINEERING

CPI - 9.1

2018 - 2022

S.J. Public School, Jaipur

INTERMEDIATE/+2 - CBSE

96.4 %

2018

Maheshwari Girls Public School, Jaipur

MATRICULATION - CBSE

10 CGPA

2016

Publications

AIAA SciTech Forum 2021

Survey and Analysis of Payloads for Missions on PSLV's Orbital Platform [\[See paper\]](#)

NCSSTA 2020

Sanket - Technology Demonstration of Antenna Deployment System on PS4-OP [\[See Paper\]](#)

Work Experience

Goldman Sachs

SUMMER ANALYST

Remote

Summer '21

- Developed vector based searching framework based on text similarity between documents and search queries to enable semantic search
- Fine-tuned a BERT model to get text embeddings of documents and queries, and integrated it with Elasticsearch vector field queries
- Manually compiled a dataset of 5k documents for analysing search results from BERT and comparing them to Lucene based searches

ZLevelApps

SOFTWARE ENGINEER INTERN

Remote

Dec '20 - Jan '21

- Developed a RESTful API for group chat backend (server-side) of Card Game 29 app in Google Play Store using Node.js + Express
- Integrated Firebase authentication (middleware) and Redis (cache) with MongoDB (database) for storing and updating group details

Praxis Business School [\[Code\]](#) [\[Report\]](#)

NATURAL LANGUAGE PROCESSING RESEARCH INTERN

Remote

May '20 - Aug '20

- Designed algorithms for summarizing the polarity of customers' opinions towards different product features based on their reviews
- Developed feature extraction pipeline to mine frequently mentioned product features, using Apriori algorithm and pruning techniques
- Fabricated an opinion mining pipeline for opinion extraction using dependency parsing, and scoring the sentiments using VADER

Avrio Energy Pvt. Ltd.

PYTHON / FIRMWARE DEVELOPMENT INTERN IN ELECTRONICS

Remote

May '20

- Explored libraries like spidev, pigpio, bcm2835 and gpio for establishing SPI communication on Raspberry Pi using GPIO (non-SPI) pins
- Successfully established I2C interface between RPi and ADE7880 using python libraries and learned about HSDC interface of ADE7880

Edelweiss Financial Services Ltd.

DATA ANALYTICS INTERN

Mumbai

Dec '19

- Acquired knowledge about credit analysis of loans especially SME Business Loans while working with a team of 15+ members
- Analysed banking & financial details provided by customers, and developed 600+ features to be used by loan default prediction model

Key Projects

Rover Path Finder [\[Code\]](#) [\[Demo\]](#)

Microsoft Engage 2020

MARS COLONIZATION PROGRAM

Summer '20

- Designed a web application to find the shortest path from the rover to the destination in a grid containing user defined obstacles
- Implemented and optimized path finding algorithms like Breadth First Search for tracing the route having the least distance
- Innovated on PathFinding.js by introducing features like multiple destinations, multiple rovers, dynamic grid size and dynamic statistics

Named Entity Recognition [\[Code\]](#)

IIT Bombay

COURSE PROJECT - DEEP LEARNING FOR NATURAL LANGUAGE PROCESSING

Spring '21

- Fine-tuned BERT model for both flat and nested NER tasks formulated with a Machine Reading Comprehension (MRC) approach
- Achieved a precision of 68% on ACE 2004 Multilingual Training Corpus and depicted superiority on NER as a sequence labeling problem

WAVS: Web App Vulnerability Scanner [\[Code\]](#)

IIT Bombay

COURSE PROJECT - FOUNDATIONS OF NETWORK SECURITY AND CRYPTOGRAPHY

Spring '21

- Developed a tool to perform inline vulnerability scan of a website for checking status of SSL/TLS certificates, XSS, open redirection, etc.
- Engineered the open redirection check module and designed HTML/CSS template to display the detailed results in a dashboard

Smart UI [\[Code\]](#)

IIT Bombay

HACKATHON PROJECT, TECHFEST, IIT BOMBAY

Jan '21

- Developed a web application for generating HTML output and JSON file containing details of all elements in a wireframe image
- Applied a three stage pipeline to detect & classify components, extract class based attributes and render JSON output into HTML template
- Employed OCR techniques using tesseract and keras-ocr to extract text and related attributes of the detected components

Knowledge Management Repository [\[Code\]](#)

IIT Bombay

HACKATHON PROJECT, TECHFEST, IIT BOMBAY

Dec '20

- Created a digital repository to store, share and easily access documents, images and videos using MySQL, FastAPI and JavaScript
- Designed an intuitive and elegant user interface for the application using bootstrap and CSS containing features like dark theme

Sanket: Antenna Deployment System

IITB Student Satellite Program

TECHNOLOGY DEMONSTRATION OF ANTENNA DEPLOYMENT SYSTEM ONBOARD PSLV STAGE 4 ORBITAL PLATFORM

Jul '19 - Present

- Proposed and analyzed Inflatable Antenna Systems as a technology demonstration payload for the mission as a part of Payload Team
- Surveyed and finalised space grade components to be used on board within design constraints from the mission requirements
- Designed PCBs using Eagle CAD for the antenna deployment system and the peripheral circuit of a single-chip transceiver CC1125

Advitiy: Communication Subsystem

IITB Student Satellite Program

ADVITIY IS THE NEXT STEP AFTER PRATHAM: FIRST STUDENT SATELLITE OF IIT BOMBAY

Spring '19

- Developed Link Budgets for Uplink, Downlink, and Beacon of the satellite after studying link budgets for various past successful missions
- Determined the Modulation Methods and System Baud Rate for communication by analyzing link margins at different Bit Error Rates
- Successfully received SSTV images broadcasted from ISS and APT weather satellite images from NOAA satellite using a handheld receiver

Fake News Classifier [\[Code\]](#)

IIT Bombay

COURSE PROJECT - ML FOR REMOTE SENSING

Spring '20

- Developed a classifier model from scratch with neural network architecture as backbone, using LSTMs and CNNs in Tensorflow
- Created the training dataset using datasets from different sources like Kaggle and GitHub; and cleaned it using NLTK and Regex libraries
- Used Glove google API as pre-trained word embedding for the model and achieved over 90% accuracy on US 2017 elections dataset

Iris Recognition [\[Code\]](#)

IIT Bombay

COURSE PROJECT - DIGITAL IMAGE PROCESSING

Autumn '20

- Designed an Iris recognition algorithm using phase components in 2D Discrete Fourier Transforms of given images in CASIA dataset
- Preprocessed images using iris localization and normalization techniques to remove parts other than iris from an eye image
- Evaluated matching score using BLPOC (Band Limited Phase Only Correlation) function and identified genuine and impostor attempts

AquaGerator[\[View\]](#)

ITC, IIT Bombay

INSTITUTE TECHNICAL SUMMER PROJECT

Summer '19

- Designed a prototype of a sustainable electromechanical system that converts water vapour in the atmosphere into drinkable water
- Explored thermodynamics of water in order to select appropriate equipment to implement the mechanical refrigeration cooling system
- Conducted experiments and generated 5-7 litres of water in over 20 hours and presented the prototype in front of 300+ people

Hangman Game [\[Code\]](#)

IIT Bombay

COURSE PROJECT - MICROPROCESSOR LAB

Spring '21

- Implemented an algorithm in C language for playing hangman game on pt-51 microcontroller using Keil μ Vision and Flip softwares
- Interfaced UART module with laptop for taking inputs through Realterm software, and interfaced LCD with pt-51 for showing outputs

Digital Smiley Display [\[Report\]](#)

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COURSE PROJECT - INTRODUCTION TO ELECTRONICS

Spring '19

- Conceptualized and designed a logic circuit to display a smiley face on 8*8 LED matrix by controlling the frequency of LM555 timer
- Devised the circuit using a down ripple 4 bit counter, 3 to 8 bit inverting decoder and an array of logic gates to control the voltage

Line Follower

IIT Bombay

ELECTRONICS AND ROBOTICS CLUB

Spring '19

- Designed an autonomous bot which follows a white line over black background and pursues predefined path in case of cross-overs
- Fabricated IR sensor circuit to detect the path and give input to Arduino Uno for control of DC motors for maneuvering of bot

FM transmitter

IIT Bombay

HAM RADIO CLUB

Mar '19

- Developed an FM transmitter circuit using a bipolar junction transistor and tuned the carrier frequency using the tank oscillator
- Successfully tested the circuit by receiving a test signal on a laptop using an RTL-SDR module and Software Defined Radio Console

Positions of Responsibility

Institute Student Mentor

IIT Bombay

STUDENT MENTOR PROGRAM

Jul '21 - Present

- Selected in a group of 133 mentors out of a 300 applicants after a rigorous interview process, careful ethical assessment and peer review
- Responsible for the smooth transition of a group of incoming undergraduate students to the academic and social life at IIT Bombay

Subsystem Head, Non-Tech Subsystem

IIT Bombay

IITB STUDENT SATELLITE PROGRAM (IITBSSP)

Jan '21 - Present

- Spearheading a 10-membered team comprising of graphic designers, content creators and web developers
- Overhauling the existing website by a fully responsive one, showcasing the new systems and plethora of resources maintained by IITBSSP
- Responsible for managing social media accounts of IITBSSP on Instagram (450+ followers) and Facebook (5.7k+ followers)

Subsystem Head, Communication Subsystem

IIT Bombay

IITB STUDENT SATELLITE PROGRAM

Jan '20 - Present

- Leading a team of 10 members to conceptualize and develop a quality assured Communication Subsystem of a satellite
- Executed a three stage recruitment process to test skills, approach and team work of the applicants; selected 8 out of 50+ candidates
- Conducted a Ground Station Workshop for more than 50 students of 15+ colleges to help establish ground stations in their colleges

Events Coordinator, Robowars

IIT Bombay

TECHFEST: ASIA'S LARGEST TECHNICAL FEST

Jan '20

- Involved in execution of India's Largest International Robowars with a budget of over 4 Million with a footfall of over 175k people
- Addressed and managed 100+ participants from 10+ International teams and 30+ Indian teams for smooth conduct of the events
- Supervised a team of 10+ organizers responsible for the planning and successful execution of 280+ events in the fest

Achievements

- Jan 2021** First in Smart UI Hackathon, Techfest, IIT Bombay
- Dec 2020** Third in Site Developer Competition, Techfest, IIT Bombay
- Aug 2020** Top three member team, Microsoft Engage 2020
- Jul 2020** Rank 164 out of 6061 team, Stage-I, Flipkart's Grid 2.0 Hackathon
- Aug 2019** Special mention for AquaGerator, Institute Technical Summer Project, IIT Bombay

Skills

Programming	Python, Embedded C, C++, Javascript, Java, Julia, HTML, CSS
Development	Tensorflow, PyTorch, Node.js, MongoDB, Redis, Ionic, MySQL
Softwares/Tools	Elasticsearch, Postman, Flutter, Burp Suite, ns-3, Wireshark, MATLAB, Scilab, EAGLE, Flip, Keil µVision, Proteus, Quartus, ArduinoIDE, SDR Console, Saturn PCB Toolkit, Realterm

Relevant Courses

Computer Science	Digital Image Processing, Computer Networks, Data Structures and Algorithms, ML for Remote Sensing-I, ML for Remote Sensing-II, Deep Learning for NLP, Computer & Network Security
Coursera	Google Cloud Platform Big Data and Machine Learning Fundamentals
edX	Computer Vision and Image Analysis, Applied Deep Learning Capstone Project
Udemy	Deep Learning A-Z: Hands on Artificial Neural Networks

Extracurricular Activities

Sports	<ul style="list-style-type: none">• Completed 80 hours of training in Chess under the National Sports Organisation• Awarded the Best Chess Player of the year (2014-15) Award in the school
Miscellaneous	<ul style="list-style-type: none">• Presented Pratham and Advitiy as a member of Student Satellite Team during ITC expo in front of 300+ people• Hosted the School Annual Function 2016, SJPS in front of an audience of 250+ people• Mentored a team of four members in XLR8 2019 to successfully make a bluetooth controlled bot