Pulkit Mishra

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WORK EXPERIENCE

Jio AICoE - Software Development Engineer, Research (July '21 to Present)

Python, Deep Learning, Computer Vision, Video Analytics, Pytorch, Django, FastAPI, Docker, Kubernetes

- Improved Jio's internal annotation tool, enabling teams to do active learning at scale
- Deployed existing models as REST APIs on Kubernetes cluster using Seldon, s2i, Docker, and Helm Charts and set up CI CD pipelines
- Generated data for Cricket Shot Action Detection from raw videos, wrote patent draft and prior art critique for the same.
- Trained model for cricket shot action classification and achieved 95.6% classification accuracy
- Trained model to spatiotemporally localize cricket shots and achieved a video mAP score of 84.8 at 0.75 IoU threshold
- Prepared a multimodal framework to learn representations using self-supervision by leveraging video, audio and text modalities that are naturally present in cricket videos.
- Prepared proof of concept application to detect possible instances of cheating during exams.
- Developed face verification service for Jio's HR team

skit.ai - Machine Learning Research Assistant, Conversational AI (May '21 to July '21)

Python, Deep Learning, Audio Processing, Librosa, Keras, Coqui TTS, NeMo

- Explored use of Spontaneous Speech data in Conversational Setting to build a Text To Speech System
- Curated transcripts for [Emotional TTS](#) - first public TTS dataset for emotions in an Indian English Accent

Major League Hacking - Open Source Fellow (Facebook - [Pysa](#))

Python, Web Security, Pysa, Flask

- Created sample Flask app and added examples to illustrate usage of Pysa to detect common vulnerabilities like SQL injections, Path Traversal, Cross Site Scripting, Remote Code Execution
- Extended Pysa's support for SQL injection and server side template injection detection

Hike Messenger - Machine Learning Intern (Apr '20 to Nov '20)

Javascript, 3D Computer Vision, Tensorflow.js, Facemesh, BabylonJS

- Generated 3D Hikemoji from human head and made the avatar replicate actions of the head in real time
- Attached custom assets like hair and cap to 3D Hikemoji and aligned their motion with human head

Google Summer of Code - Student Developer (CCExtractor - [Poor Man's Rekognition](#))

Python, Deep Learning, Computer Vision, TensorFlow, TensorFlow Serving, Django, Docker, Travis CI

- Trained and deployed models for scene text detection, scene text recognition, object detection, scene classification, face detection in both images and videos
- Containerized the project using Docker, setup custom logger, made code PEP-8 compliant, wrote necessary unit tests and setup CI for the repository using Travis

Invigilo Technologies - Computer Vision Intern (Jan '20 to Mar '20)

Python, Deep Learning, Computer Vision, Video Analytics, Pytorch

- Trained model for real time instance segmentation of barricades, excavator body and excavator arm in construction site videos.
- Trained model for detecting presence of trenches and shorings in construction site images.

Machine Origin - Deep Learning Intern (Sep '19 to Oct '19)

Python, Deep Learning, Computer Vision, Video Analytics, Audio Processing, TensorFlow, Keras

- Worked on detecting presence of Indian celebrities in videos
- Trained model for video genre classification
- Implemented module to detect instances of laughter from audio in videos

Superbolter - Software Developer Intern (Jun '19 to Jul '19)

Python, Deep Learning, Computer Vision, Natural Language Processing, Keras, NLTK, Algorithmia

- Trained and deployed model to recommend room images on the basis of input text description
- Improved the web crawler by bypassing the crawl block of several websites

EDUCATION

Indian Institute of Information Technology, Kalyani - West Bengal, India

Bachelors in Technology (B. Tech.) - Computer Science and Engineering
Graduated **July 2021**
Cumulative GPA: 9.41 | **Department Rank 2**

Swaraj India Public School, Kanpur - Uttar Pradesh, India
Class 12: 96.5%
Class 10: 95.6%

PROJECTS

Virtual Tourist Guide for Government of Goa - [Link](#)

Python, Deep Learning, Computer Vision, Keras, TensorFlow, FastAPI, Kubernetes, Flutter, Firebase

- Scraped data and trained model to classify monuments of Goa
- Deployed model as FastAPI service and integrated its TFLite version inside Flutter mobile app
- Added voice support to the Flutter mobile app using Google Assistant Actions

AI Powered Wearable to Assist Visually Impaired - [Link](#)

Python, Deep Learning, Computer Vision, Video Analytics, Keras, TensorFlow, Alexa Skills, Raspberry Pi

- Implemented image captioning, object detection and face recognition of user's friends and relatives to give the visually impaired user a brief summary of their surroundings

CI and Version Control for Machine Learning - [Link](#)

Python, Machine Learning, Jenkins

- Developed a tool to help data scientists by providing data visualization, performance metrics and version controlling of machine learning models, datasets and experiment hyperparameters

AI Powered Counselor for Detecting and Treating Depression - [Link](#)

Python, Artificial Intelligence, Natural Language Processing, Audio Processing, Alexa Skills, NLTK

- Trained models to detect the possibility of depression by checking for abnormality in user's behaviour and applying sentiment analysis on user's social media profile
- Added features to warn user's trusted contacts in case of emergency, suggest therapy recommendations and location based activities to improve the user's mood

Architecture Style Recognition

Python, Deep Learning, Computer Vision, Keras, TensorFlow

- Scraped data and trained model to classify architectural styles of monuments of West Bengal

Correction of Annotation Affected Words in Document Images

Python, Deep Learning, Image Processing, Natural Language Processing, Keras, TensorFlow, NLTK

- Removing annotations from document images for improving OCR input
- Spelling correction and grammar correction for improving OCR output

E-Tendering on Blockchain - [Link](#)

Python, Blockchain, BigchainDB, Inter Planetary File System

- Automates the process of tendering and makes the bidding process secure and transparent

Smart and Secure Shopping System - [Link](#)

Python, Internet of Things, Raspberry Pi, Android, Firebase

- Eliminates the need of a queue in shopping malls by automating billing process while simultaneously helping in inventory management

Social Network for Literature Enthusiasts

Python, Django, HTML, CSS, Javascript, PostgreSQL

- Platform to share and read poems, novel extracts and other literary pieces and engage with other people with similar taste in literature

SKILLS

Python, C, C++, Java, Shell, SQL, TensorFlow, Keras, PyTorch, Numpy, OpenCV, Pandas, Matplotlib, Seaborn, NLTK, HuggingFace, Deep Learning, Machine Learning, Computer Vision, Image Processing, Video Analytics, Audio Processing, Natural Language Processing, Django, Flask, FastAPI, Tensorflow Serving, PyQt, Alexa Skills, Docker, Kubernetes, Linux, Git.

ACHIEVEMENTS

- Google Summer of Code Mentor in 2021 and 2022
- Winner, Smart India Hackathon 2020
- Second Runner-Up, CodeUtsava 3.0, NIT Raipur Hackathon
- Best Hardware Hack, Hack-A-BIT, BIT Mesra Hackathon
- Vice President, Student Government Body IIIT Kalyani
- Founding Member, Institute Innovation Cell IIIT Kalyani
- Founding Member, Free and Open Source Club, IIIT Kalyani
- Creative Head, Udaan, Literary Club IIIT Kalyani
- School Captain, School Government Association, Swaraj India Public School
- Winner, Tech Talk Debate, Comfest
- Winner, Frank Anthony Memorial Debate
- Runners Up, ASISC Declamation Nationals
- Runners Up, ASISC Debate State Level
- Winner, Rotary Club Quiz Competition Nationals