Pranav Bhagwat

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Education

Pune Institute of Computer Technology (PICT) **July 2019 - June 2023**
*Bachelor of Engineering in Information Technology (**CGPA : 9.31**)* *Pune, Maharashtra, India*

The Bishop's Junior College, Camp **July 2017 - May 2019**
*12th, Indian School Certificate, Science (**92%**)* *Pune, Maharashtra, India*

The Bishop's Co-Ed School, Kalyaninagar **July 2016 - May 2017**
*10th, Indian Certificate of Secondary Education (**92.6%**)* *Pune, Maharashtra, India*

Work Experience

Thelios.ai (under Sportsseam LLC) - Full-time **Aug 2023 – Present**
Computer Vision Engineer | Deep Learning | DevOps | Python *Pune, Maharashtra, India*

- Developed modules using Deep Learning models for player detection, identification and discrimination, player positions and skill identification, game-specific action recognition, and in-game critical event recognition for American Football.
- Created a workflow orchestration pipeline using Apache Airflow.
- Migrated the on-premises pipeline to AWS using Docker, Nginx and AWS services.
- Developed a client facing website to serve a SaaS solution.
- Mentored 15+ interns for various tasks such as dataset preparation, model training and evaluation.

Isomorphic Design Lab LLP - Internships **Nov 2020 – Nov 2023**
Software Development Intern | App Development | Python | Socket Communication *Pune, Maharashtra, India*

- Developed a Flutter desktop application to interface with RFID tags and sensors to display product details on a department store kiosk.
- Created a desktop application using Python and PyQT to control servos in military hardware.
- Utilized socket communication for interfacing with peripheral devices in custom data formats.

UST - Internship **May 2022 – June 2022**
Software Development Intern | Python | Natural Language Processing *Pune, Maharashtra, India*

- Provided data analysis and visualisation to gain insights into work done on genetic data using NLP.
- Used technologies such as Python, Seaborn and NLTK to create a comprehensive story.

BMC Software - Internship **Jan 2022 – June 2022**
Software Development Intern | Python | Machine Learning | Natural Language Processing *Pune, Maharashtra, India*

- Developed a proof-of-concept anomaly detection solution for networking device configuration files using NLP and Machine Learning algorithms. Achieved 86% accuracy.
- Co-ordinated and led a team of 4 in a corporate environment.
- Worked with REST APIs for dataset creation and implemented feature engineering techniques using Python.

Research Experience

Transcribing Guitar Tablatures From Music **Aug 2022 - May 2023**
Automatic Music Transcription | Deep Learning | Source Separation | Web application *Pune, Maharashtra, India*

- Proposed a pipeline for generating guitar tablatures for any given audio input containing guitar sound.
- Utilized existing state-of-the-art models for source separation and developed a custom heuristic algorithm for tablature generation.
- Packaged the entire system as an accessible web application for end users.
- Presented the paper at the International Conference on "Computing, Communication, Control and Automation"
- Paper publication process is ongoing.

A Survey on Automatic Music Transcription **Aug 2022 - Jan 2023**
Automatic Music Transcription | Deep Learning *Pune, Maharashtra, India*

- Surveyed different approaches for achieving Automatic Music Transcription using various methods based on pitch, timbre and note detection.
- Discussed Deep Learning based approaches for both source separation and transcription based on input encoding.
- Published the paper in Iconic Research And Engineering Journals.

Image Captioning for Low Resource Languages **July 2022 – Apr 2023**

Deep Learning | Computer Vision | Natural Language Processing | Python *Pune, Maharashtra, India*

- **Paper Title: Evaluating performances of attention-based merge architecture models for image captioning in Indian languages**
- Worked in a team of 4 to implement attention-based merge architecture models to achieve accurate image captioning in 4 low resource Indian languages - Marathi, Kannada, Malayalam, and Tamil.
- Demonstrated which merge architectures performed the best for BLEU scores of different n-grams.
- Presented the paper at the International Conference on Computer Graphics and Image Processing (CGIP)
- Published the paper in the Journal of Image and Graphics(United Kingdom)

Evaluating techniques for classifying rotten fruits **July 2022 – Sept 2022**

Deep Learning | Computer Vision | Natural Language Processing | Python *Pune, Maharashtra, India*

- **Paper Title: Evaluating performances of various CNN architectures for multi-class classification of rotten fruits**
- Worked in a team of 3 to implement various CNN architecture models to test performance of rotten fruit classification.
- Demonstrated which architectures performed the best using measures such as Recall, Precision and Accuracy.
- Presented the paper at the Sardar Patel International Conference on Industry 4.0 - Nascent Technologies and Sustainability for 'Make in India' Initiative
- Published the paper in the Institute of Electrical and Electronics Engineers

Projects

NAZAR | *Python, Deep Learning, Flask* **Mar 2022 - May 2022**

- Collaborated with a Masters student at the Royal College of Art (RCA), London on their thesis project.
- Nazar is an interactive installation that consists of a face detection algorithm designed to be lightweight, real-time and highly accurate using a convolutional neural network (CNN), Open CV in Python and Flask.
- It has a live feed and can detect multiple users at once and aims to bring attention to digital surveillance and privacy in the modern age.

Transcribing Guitar Tablatures from Music | *Python, DSP, Flask, Heuristic Algorithm* | **Aug 2022 - May 2023**

- Surveyed the current landscape of music transcription and tested multiple FOSS source separation models.
- Worked on musical note detection using Digital Signal Processing (DSP).
- Created a heuristic algorithm for generating guitar tablatures from musical notes.
- Developed Flask APIs for the user facing web application to call upon.
- Led a team of 4 to complete this as a Final Year Engineering Project.

Stock Market Predictor | *Python, LSTM, Streamlit, API* | Stock-Market-Predictor **Feb 2022 - May 2022**

- Used public APIs to fetch real-time data about various stock exchanges like NASDAQ.
- Trained a Deep Learning LSTM model to predict stock prices.
- Built an interactive webpage using Streamlit to visualize the data and communicate the results.
- Successfully predicted the stock prices for Apple, Google and Microsoft using the NASDAQ stock exchange data.

Technical Skills

Languages: Python, C++, Java, Shell-scripting, SQL, NoSQL (MongoDB), Dart, Latex
Machine Learning: Regression and Clustering techniques, Deep Learning, Computer Vision, Natural Language Processing
Frameworks: PyTorch, TensorFlow, OpenCV, Pandas, Flutter, Flask, Apache Airflow, Docker, Amazon Web Services
Developer Tools: Git, VS Code, Arduino IDE, Flutter, Android Studio, Tableau

Student Organizations

PICT Robotics Club **Aug 2019 – Aug 2023**

Documentation Head

- Achieved All-India-Rank (AIR) 6 in the National ABU Robocon 2022 competition in IIT Delhi.
- Wrote the technical Design Detail Document for Stage-1 submission. (98/100 points)
- Conducted a workshop to introduce over 50 students from 10th grade and above to robotics.

PICT Debate Society **Aug 2020 – Aug 2021**

Director of Internal Affairs Committee

- Managed all internal club activities such as public speaking workshops and competitions.
- Organised induction program for over 400 students and led a team of 30 members.
- Led a 36 person team to organize the first Intra and Inter College Public Speaking and Debate competition: PARICHARCHA 2021.

Achievements

- Prize-winning state-level debater and extempore speaker.
- Received Brigadier N.B. Special Prize in 12th standard for Exceptional Achievement in English.
- Won a state-level Inter-School Short Story Writing Competition in the 12th grade.
- Selected from 800 students to represent my school in the Albert Barrow National Essay Writing Competition in the 10th grade.
- Won a State Level Filmmaking Competition in the 10th grade in a team of 5.
- Black Belt in Shotokan Karate and Gold medalist in Karate Competitions (both Kata and Kumite).