



Aditya Raj

B.Tech

Electronics and Communication Engineering

National Institute of Technology, Patna

+91- 8797073498

adityar.ug22.ec@nitp.ac.in

linkedin.com/in/hexronus

github.com/hexronuspi

codeforces/profile/hexronus

portfolio/aditya/academics

EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
ECE	National Institute of Technology, Patna	7.76	2022-2026
Senior Secondary	CBSE	93.20%	2020-2022
Secondary	ICSE	90.20%	2010-2020

CONFERENCE PAPER(REJECTED)

- **EEG Functional Connectivity Feature-Based Diagnosis of ADHD Using Deep Learning on Raspberry Pi** submitted to International Conference on Signal Processing and Communications (SPCOM 2024) PaperID - 204.
Authors: Rakesh Ranjan, Shiva Singh Bagri, **Aditya Raj**, Dr. Bikash Chandra Sahana^{PI}
Affiliation: National Institute of Technology, Patna

EXPERIENCE

- **IIT Jodhpur** May 2024 - July 2024
Research Intern: SIP@SAIDE 2024 Remote
Supervisors: Dr. Bikash Santra and Dr. Dipanjan Roy
– Implemented **image classification algorithms** utilizing various architectural models (**AlexNet, MobileNet, EffNet, Custom Attention and CNN**) on **FER 2013 Facial Image Dataset**, achieving a maximum accuracy of **53%** on the test dataset.
– Applied **signal processing techniques** and extracted features using **CNN sliding window technique** to build a **multimodal model** by fusing **EEG and video data** on the **SEED V dataset**.
- **IIT Guwahati** May 2024 - July 2024
Intern: Dept. of CSE 2024 Remote
Supervisor: Dr. Arijit Sur
– Developed a system in .py to **generate a diverse synthetic dataset of geometric shapes** and used PyTorch to write a **GAN for image completion** and **Generating Images using the UNet Architecture** for Generator.
– Implemented a **text-translation model** from scratch on **IITB Eng-Hindi Parallel Corpus**, used spacy's en-core-web-sm for english tokeniser and indic-bert for hindi tokeniser, using **GRU and attention mechanisms** with TorchText, achieving a **Test Perplexity (PPL) of 19.258**.
– Developed an **LSTM-based stock predictor** using AAPL data from NASDAQ(5 years), achieved an **average accuracy of 93%** on the test dataset (**Test RMSE 0.07**).

PROJECTS | (ALL PROJECTS ARE ON PERSONAL PORTFOLIO)

- **Image Based Audio Generation** Link | June, 2024 - Present
Tools: Python, OpenCV, OpenAI CLIP, Hugging Face GPT-2M Reference Paper: ClipClap, AudioClip
– Implemented an **image captioning system** using **CLIP** and a **PyTorch-based GPT variant**, increasing the number of **contextually similar generated words by 30%** through **edge enhancement**.
- **Shape reconstruction | Adobe GenSolve Hackathon 2024** Link | July, 2024 - August, 2024
Tools: Python, Shapely, PyTorch, OpenCV, Skimage, Bezier
– Developed a **Shape Regularization Pipeline** in Python to classify and regularize geometric shapes. Ensuring conformity to predefined criteria using **contour**.
– Created a **Bilateral Symmetry Detection System** in Python by implementing **SIFT** for keypoint detection and **BFMatcher** for descriptor matching. Utilized **hexbin analysis** and mathematical transformations to accurately detect and visualize symmetry axes in images.
– Created a **shape classification** model using a hybrid **Genetic Algorithm-Neural Network** for handling complex shapes like stars and polygons, with optimized edge detection and contour approximation for high-performance image processing.
– Integrated **Bézier curve fitting** using **scipy** and **sklearn** into a shape completion pipeline, used **scipy spatial computations**, including **ConvexHull** and **Delaunay triangulation** for smooth curve generation.

TECHNICAL SKILLS

Languages: C/C++, Python

Miscellaneous: MongoDB, Git, GitHub

AI/ML: Pytorch, Tensorflow, scikit-learn, OpenCV, Numpy,

Pandas, SciPy, Hugging Face, Matplotlib, Seaborn, Keras

POSITIONS OF RESPONSIBILITY

Team Coordinator, AI/ML Google Developer Students Club, NITP

August 2023 - June 2024

–Conducted an **open-book pure mathematics test** for the **selection of first-year trainees**.

–Designed **AI/ML questions** for the **TCF Technical Contest**.

ACHIEVEMENTS

Adobe GenSolve	Ranked among the top 5%ile .	2024
IOQA	Qualified National Standard Examination in Astronomy (HBCSE, Mumbai).	2022
NTSE	Qualified National Talent Search Exam Stage I .	2020
RMO	Among top 1% of students from classes 8th-12th in India and scored 44/102 .	2019
PRMO	Qualified Pre-Regional Mathematical Olympiad (2018, 2019, and 2021).	
METER	Achieved State Rank 7th from Bihar Region among 50K+ students .	2017