Shubhranshu Pattnaik

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EDUCATION

Chandigarh College Of Engineering & Technology, Panjab University — Chandigarh
Bachelor of Engineering(Hons.) | Major in Electronics & Communication Engineering — August 2019 - June 2023
Cumulative GPA: **8.98/10.00 (Rank 2 Holder);**
Relevant Coursework: Data Structures & Algorithms; Operating Systems; Artificial Intelligence; Programming for problem solving;

SGGS Collegiate Public School, CBSE — Chandigarh
Intermediate/+2 | Percentage: **92.6/100;** — April 2018 - May 2019

Delhi Public School — Rourkela, Odisha
Matriculation | Cumulative GPA: **10.00/10.00;** — April 2016 - May 2017

TECHNICAL SKILLS

- **Programming languages:** C, Python, Javascript, Microprocessor & Microcontroller programming
- **Libraries & frameworks:** Pandas, Numpy, Seaborn, Matplotlibs, Pylabs, SKLearn, PyTorch, OpenFace, OpenCV, TensorFlow, Keras, LangChain, Whisper
- **Tools & Technologies:** Node.js, Angular, SQL,IOT, Machine Learning, Computer Vision, Deep Learning, Neural Networks, Arduino, IOT, MATLAB, Express.Js, REST APIs, HuggingFace, GenerativeAI

WORK EXPERIENCE

JungleWorks | JUGNOO — Chandigarh
SDE Intern(PPO Offered) — Jan 2023 – July 2023
- Crafted efficient and top-tier **Rest APIs** and **optimized** underperforming APIs
- Developed & implemented various features for globe clients on both the **backend & frontend**
- Troubleshot & fixed bugs for numerous clients in the **production environment**
- **Optimized SQL queries** for faster and smooth functioning of the application
- Got the **highest rating** among all the interns

Terminal Ballistics Research Laboratory(D.R.D.O) — Ramgarh, Haryana
Research Intern — July 2022 – Aug 2022
- Analyzed the effects of meteorological conditions over experimental trial outcomes using **Data Science** Techniques
- Implemented various **correlation techniques** like **pearson's product moment correlation, spearman's rank correlation & kendall correlation** to find correlation between various weather parameters
- Developed a **predictive model** using various algorithms like r**andom forest, support vector and different gradient boosting algorithms like XGBoos & lightGBM**

Tech Mahindra — Chandigarh
AI Intern — Jan 2022 – April 2022
- Developed **computer vision software** to track & count people
- Utilized **YOLOv3** to develop software for tracking animals in the street

Finland Labs
Summer Trainee — July 2021 – Aug 2021
- 4 weeks online summer training & internship on **Machine Learning with Artificial intelligence & Internet of Things(IOT)**
- Developed a **smart home automation system** using **AWS**

PROJECTS

ANTENNA FAULT DETECTION USING CNN AND REAL-TIME DASHBOARD — Aug 2023 – Nov 2023
- Developed a fully connected **deep learning model** using **CNN** to detect the faulty element
- Implemented various optimisation algorithms like **PSO**, **GWO** and **Genetic Algorithm** to enhance the accuracy of the model
- Constructed a real-time dashboard using **Node.js** & **Angular** to analyze the radiation pattern and detect the element at fault

VIRTUAL TUTORING ASSISTANT USING GENERATIVE AI — July 2023 – Aug 2023
- Utilized **OpenAI APIs** to create a virtual tutor and implement **NLP** libraries like **spaCy** to interpret and understand the intent behind the student's question
- Developed a system to track student's progress and preference for generating more personalized response and tailored content as per the student's requirement

PACKAGE DELIVERY APPLICATION — Jan 2023 – Feb 2023
- Developed during the first month of my internship as a part of full-stack development training at JungleWorks
- Constructed a fully-fledged package delivery app using **node.j**s and **angular**
- Designed & implemented highly **optimized architecture** and highly efficient **Rest APIs**

UPPER TORSO HUMANOID — July 2022 – Nov 2022
- Built an upper torso humanoid that takes in voice commands to perform operations using **speech to text translation**
- Implemented facial recognition using **computer vision**
- Designed to mimic human movements wirelessly using flex sensors

- Awarded **3rd price** in **Innovative Product Design** held at university

HUMANOID ARM   Feb 2022 – May 2022
- Constructed an humanoid arm using flex sensors, arduino and gesture recognition
- Utilized **OpenCV, Mediapipe & robotic simulation software ROS** to develop the software to control humanoid movement through gestures

SMART ATTENDANCE SYSTEM   Sept 2021 – Nov 2021
- Developed a smart attendance system using **RFID RC522, Arduino and face recognition**
- Used **RFID to plx-daq excel data migration** to store the information of punch in and punch out in the database.
- Implemented face recognition to mark attendance automatically using libraries like **cv2** and **face_recognition**

ADAPTIVE HOME AUTOMATION SYSTEM   Sept 2021 – Nov 2021
- Constructed a **wireless adaptive smart home system** using **AWS** & **Deep Learning**
- Implemented facial emotion recognition using **computer vision** to set the room conditions accordingly
- Utilized **IFTTT** to give voice commands using **IOT**

FACIAL EMOTION RECOGNITION SOFTWARE   July 2021 – Aug 2021
- Designed an application to **recognise human facial expressions** to filter & map corresponding emojis with the help of **computer vision & deep learning**

TRAFFIC SIGN DETECTION SOFTWARE   July 2020 – Aug 2020
- Developed a traffic sign detection system for autonomous vehicles using **CNN** and libraries like **tensorflow and keras**

BANK FD PREDICTION MODEL   April 2020 – May 2022
- Using **data science & classification algorithms** built an application to predict whether a client will subscribe to term deposit or not.
- Developed as a solution for a real life business problem

AUTONOMOUS MAZE SOLVING BOT   Sep 2019 – Oct 2019
- Built an autonomous robot using **Arduino, motor drivers & IR sensors** which could track and calculate the shortest route in a maze and follow the shortest path from start to end.

PUBLICATIONS

- MAPCON-2023, IEEE sponsored international conference (Accepted)
  This paper presents **particle swarm optimized convolutional neural network (PSO-CNN) for antenna array fault diagnosis**. The CNN hyperparameters are tuned by employing two evolutionary algorithms separately and their performance is discussed. The Fault scenarios dataset of 4 X 4 planar antenna array is generated using Ansys HFSS and CNN model is implemented using Tensorflow 2.6.0 Google platform. Three kinds of faults; the feed point fault, network fault and fault at patch are addressed in this paper. The result of fault diagnosis using PSO-CNN is compared with a genetic algorithm optimized CNN (GACNN).

- Wireless & Personal Communication Springer Journal, international SCI journal (In Review stage)
  This paper presents an **evaluation of Decision Tree (DT), Random forest tree (RFT), K Nearest Neighbors (KNN), and Naïve Bayes (NB) ML techniques to locate faults and the type of fault**. Further parameter tuning of DT, RFT, KNN, and NB ML models is done to achieve optimal performance of these models. These tuned models are used in an ensemble approach to enhance prediction accuracy and generalization of the model. Feed network fault, feed point fault, and fault at patch are the three kinds of faults addressed in this work. Two ensemble approaches, i.e., Tuned Stacking Ensemble Learning and Tuned Majority Voting Ensemble Learning, are evaluated in this work for fault detection in planar 4 X 4 antenna array

- Published the research- **Compact Wearable Fractal Patch Antenna and its Performance Analysis for BAN** in the Thirty Sixth National Convention of Electronics and Telecommunication Engineers on Antenna Design for Efficient Communication and Networking, December 4-5, 2021, pp. 122-130. (ISBN 978-93-90953-99-8)

POSITION OF RESPONSIBILITY

Student Head, Institute Innovation Cell(IIC) in college	Dec 2021 - Dec 2022
Branch Manager ECE, Training & Placement Cell in college	Dec 2021 - Dec 2022
Editor of the ECE Tech. Magazine in college	Dec 2021 - Dec 2022
Executive Board Member, 7Notes-Music Society in college	Nov 2021 - Dec 2022
Executive Head, Roboknox-Robotics & Automation Society in college	Oct 2021 - Dec 2022
Event Coordinator, Apratim'19, Cultural & Technical Fest	Aug 2019 - Oct 2019
Class Representative, B.E ECE	Aug 2019 - June 2023
Event Coordinator, Delhi Public School	May 2016 - Dec 2016
Vice-Captain Badminton Team, KBDAV Centenary Public School	April 2013 - Jan 2014

CERTIFICATIONS

- Neural Networks & Deep Learning, Deeplearning.AI- Coursera
- Digital image processing using CNN
- Data Science(100% Grade), Internshala
- Introduction to AI, IBM-Coursera

- Python Programming, Hacker Rank
- Crash Course on Python, Google- Coursera
- Android Development, Internshala
- Google Android Development, Techfest- IIT Bombay

AWARDS & ACHIEVEMENTS

- Institute **Merit Scholarship** Holder, award for academic excellence(Rank 2 Holder in the School of Engineering)
- **Third Prize**, **Innovative Product Design**(Upper Torso Humanoid), Chandigarh College of Engineering & Technology, Chandigarh
- **National Finalist,** Meshmerize, Robotics, **IIT Bombay,** Bombay
- **First Prize,** Meshmerize - Autonomous Maze Solving Bot, **Robotics**, PECFEST, **Punjab Engineering College**, Chandigarh
- Secured a place in the **top 6** teams out of **200 participants** in the prestigious internal **Smart India Hackathon** organized by the **Ministry of Education-India**, showcasing exceptional skills and **problem-solving abilities**.
- **First Prize**, Bot Pull - Bot Tug Of War, **Robotics**, Science Day, Chandigarh College of Engineering & Technology, Chandigarh
- **Hackerrank, 5-Star-Python** Programming
- **First Prize**, Line Follower Bot, Apratim 2019, Cultural & Technical Fest, Chandigarh College of Engineering & Technology, Chandigarh

EXTRAMURAL ACTIVITIES

- Performed as the lead guitarist in various intra and inter-college musical events and open mics
- Won the CCET Inter-year football tournament 2022, Chandigarh College of Engineering & Technology, Chandigarh
- Reached till the Quater-finals in the inter-year badminton tournament 2021, Chandigarh College of Engineering & Technology, Chandigarh
- Designed various digital posters for Government Events in Collaboration with Chandigarh College of Engineering & Technology, Chandigarh
- Conducted a 3-day workshop on Robotics & AUTOCAD in collaboration with ASME at Chandigarh College of Engineering & Technology, Chandigarh
- Delivered seminars and conducted workshops on Micro-controllers, Robotics, Machine learning, Deep Learning and Neural Networks