AYUSH RAJ

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Education

Indian Institute of Technology (BHU) | *B.Tech & M.Tech in Biomedical Engg.* Varanasi | 2022-Present

Semester	Ist	IInd	IIIrd	IVth	Vth	VIth	VIIth	VIIIth	IXth
SPI*	7.37	9.20	9.70						

*SPI(Semester Performance Index) out of 10

(Department Rank:- 4)

St. Xavier's College | *Intermediate of Sciences (88.2%)* Ranchi | 2019-2021

- Affiliated to Jharkhand Academic Council (JAC)

D.A.V CENT. Public School | *Secondary School Certificate (93.8%)* BNP/TS(SAIL) | 2008-2019

- Affiliated to Central Board for Secondary Education (CBSE)

Skills & Competencies

- **Programming Languages :** C++, C, Python
- **Software Applications :** Excel, MATLAB, Origin, Words, MySQL
- **Machine Learning :** Supervised ML Algorithms (Logistic Regression, SVM, Random Forests, KNN, Gradient Booster & decision trees) & Unsupervised ML Algorithms(K-Means Clustering & PCA), Open CV
  - *Certification:- 8-Week IIT-G ML&AI Bootcamp Course (LINK)*
- **Product Management :** Research ability, Business Analytics, Market Analysis, Strategic Thinking, Communication skills,
  - *Certification:- IIT-G Product Bootcamp Course (LINK)*

Projects

School of Bio-Medical Engg, IIT(BHU) | *Under-graduate Researcher* Computational Neuroscience Lab | 2023

- **Title:- Characterizing ASD Subtypes using Morphological Features from sMRI with Unsupervised Learning**
- Developed a machine learning model to identify subtypes of **Autism Spectrum Disorder (ASD)** using structural magnetic resonance imaging (sMRI) data. Preprocessed sMRI data using FreeSurfer toolbox and segmented brain regions into 148 regions of interest using the Destrieux atlas. Extracted features including volume, thickness, surface area, and mean curvature for each brain region. Conducted principal component analysis **(PCA)** on these features and identified the top 10 components. Applied **k-means clustering** on the top 10 features and validated the optimal number of clusters using Silhouette and elbow method**.**
- The amalgamation of these techniques offers a promising method for discerning ASD subtypes, *potentially serving as a robust screening tool* by providing nuanced insights into structural brain differences associated with ASD.
- **Authored** Conference paper titled same which got accepted for publication in ***International IEEE I2MTC'24 Conference, Glassgow***, ***Scotland***. | Publication of paper halted due to financial constraints.

Independent Project | *Under-graduate Student* Jan,2024-Present

- **Title 1:- Predictive Analysis of Heart Disease with Supervised Learning*****
- **Link to Access:-** For Heart Disease predictor (LINK)
- Utilized dataset from 1988 and consists of four databases: Cleveland, Hungary, Switzerland, and Long Beach V. about heart disease patients with 14 attributes including age, sex, chest pain type, blood pressure, cholesterol level, fasting blood sugar, electrocardiographic results, maximum heart rate, exercise-induced angina, ST depression, ST segment slope, number of major vessels, and thalassemia type.
- Started with finding *Correlation matrix*, applied 6 algorithms **including Linear Regression, SVM, KNN, Random Forest Classifier, Decision trees and Gradient Booster.** Identified Random Forest as most accurate for training and deployment. Created GUI for user interface.
- **Title 2:- Predictive Analysis of Diabetes in women with Supervised Learning*****
- **Link to Access:-** For Diabetes predictor (LINK)
- Utilized dataset from the *National Institute of Diabetes and Digestive and Kidney Diseases*. It includes diagnostic measurements for females at least 21 years old of Pima Indian heritage. Attributes include pregnancies, glucose concentration, blood pressure, skin thickness, insulin level, BMI, diabetes pedigree function, and age. Objective is to predict diabetes based on these measurements.
- Started with finding *Correlation matrix*, applied 6 algorithms **including Linear Regression, SVM, KNN, Random Forest Classifier, Decision trees and Gradient Booster.** Identified Decision Trees as most accurate for training and deployment.

****this projects are initial results of my vision to make unified integrated ML-based platform to predict commonly neglected yet harmful conditions which can be either controlled or eradicated with early detection .*

Extra-Curricular Activity (Held at IIT BHU)

- Secured 1st Runner up at ABHIPRAYA'22 for co-ideating 'Shakti,' an e-commerce platform emphasizing sustainability.
- Achieved 4th position at Scientist of Utopia'23 by solving mass extraction challenges for a hypothetical planet.
- Finalist at Siemens Innovation Think Tank, presenting a detailed report on challenges in healthcare and our vision for self-sustaining hospitals.
- Winner of Stand-up comedy event in Aagman'22 & Kashiyatra'24

Position of Responsibility (POR)

- **Academic Mentor |** Tutored CSO101 (Introduction to Programming) to first year students on behalf of Student Counselling Service
- **Inter IIT Team |** Represented IIT BHU comic team (Standup & Improv comedy) in Inter IIT Cult Meet 6.0 at IIT KGP