



# Padmaja Bodavula

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Pursuing a Bachelor's Degree in Mechanical Engineering from IIT Bombay

Pursuing a Minor Degree in **Artificial Intelligence** and **Data Science** from C-MInDS, IIT Bombay

## KEY PROJECTS

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### Data-driven Building Layout Analysis | Course Project | IIT Bombay (Apr '24)

*Enhancing design efficiency through data-driven insights and machine learning techniques*

- Conducted **feature extraction** and utilized libraries like Pandas, Seaborn for exploratory data analysis
- Applied **clustering algorithms** and scikit-learn for effective architectural layout categorization
- Developed a **predictive model** and **classification** system to assess building layout complexity and streamline the processes for layout retrieval and categorization

### SustAIlify Hackathon | Sustainability Cell & SustEarn (Feb '24)

*48-hour **International Student Sustainability and Data Analytics Hackathon***

- Placed **6th** out of **200+** teams, showcasing proficiency in tackling model **accuracy** challenges
- Utilized **data analytics** to model demand patterns and worked on minimizing cost and carbon footprint
- Employed optimization algorithms fine-tuning electricity procurement strategy for manufacturing plant

### Pattern Recognition with Neural Networks | Analytics Club | IIT Bombay (Dec '22 - Jan '23)

*Hands-on project to develop a model that can classify handwritten digits*

- Proficiently employed **NumPy** for handling intricate multi-dimensional arrays
- Leveraged **Matplotlib** for data visualizations and integrated **machine learning models** effectively
- Gained knowledge in NN implementation, including layer design and architecture optimization.

### Fault diagnosis using ML| Course Project | IIT Bombay (Oct '23- Nov '23)

*Hands-on project aimed at developing an ML algorithm to detect wafer-induced flaws in semiconductor*

- Developed & implemented ML algorithms including **Logistic Regression**, **SVM**, & **Random Forest**
- Employed rigorous evaluation techniques such as confusion matrix analysis and k-fold cross-validation
- Demonstrated proficiency in feature engineering and hyperparameter optimization to enhance model performance addressing the complexities of semiconductor wafer data
- Leveraged domain expertise in semiconductor manufacturing to create a robust fault diagnosis solution, emphasizing interpretability and practical deployment considerations for real-world applications.

### Machinery Fault Diagnosis with ML | Course Project | IIT Bombay (Mar '24- Apr '24)

*Vibrational Fatigue Analysis of electric motors using lab-based sensor data*

- Reviewed some papers within the domain of machine condition monitoring in manufacturing.
- Worked on understanding feature extraction strategies and data analysis methodologies within the field
- Re-implemented the machine learning algorithms like Support Vector Machine (**SVM**), k-Nearest Neighbors (**KNN**), and Gaussian Naive Bayes (**GNB**) as delineated in the paper
- Assessed the models' accuracy using **Weighted Accuracy** (WA) due to the balanced nature of the data, with the Support Vector Machine (SVM) achieving a WA of **99.75%** in 5-fold cross-validation.

## SKILLS

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Relavant Skills    Machine Learning, Data Science, Deep Learning, Artificial Intelligence, Python, C, SQL, Spark, Hadoop

Other Skills        AutodeskFusion360, SolidWorks, Abaqus, MATLAB, WireShark