
SURGICAL - DEEPNET

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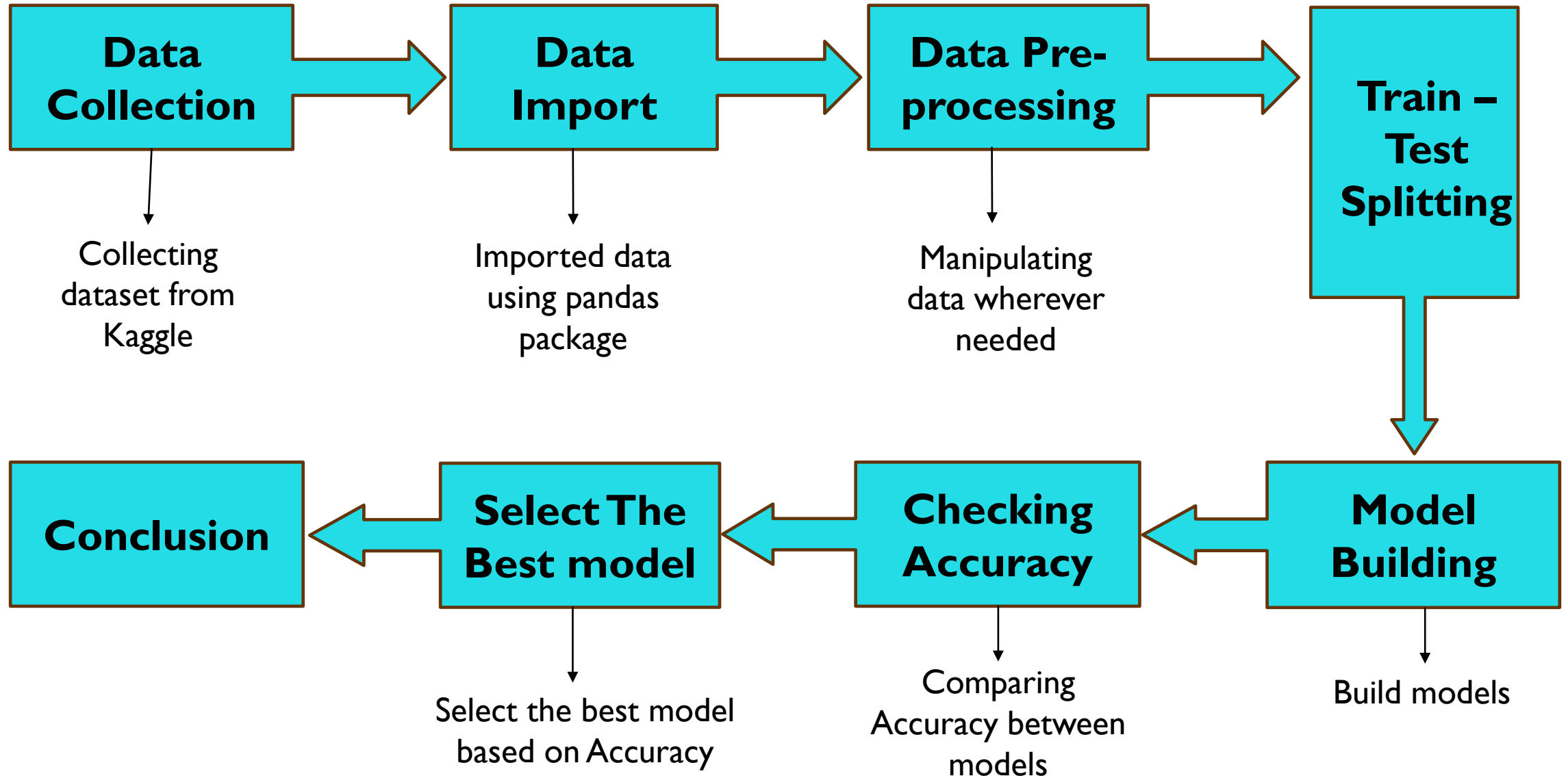
ABOUT DATASET

Our project, "Surgical Deepnet Binary Classification," leverages deep learning to predict surgical outcomes. By integrating patient data and procedural details, we aim to provide accurate insights for clinicians, enhancing decision-making in diverse surgical scenarios. This presentation outlines our objectives, methodology, and expected contributions in advancing predictive analytics for improved patient care

OBJECTIVE

“The goal of my project is to predict whether a certain surgical outcome is successful or not based on various features”

WORK FLOW

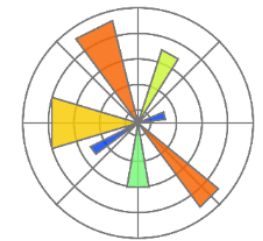


TOOLS AND PLATFORM USED

❖ Tools : Python



❖ Platform : Jupyter Notebook



❖ Library Used : Numpy, pandas,
Matplotlib, Seaborn, Scikit-Learn



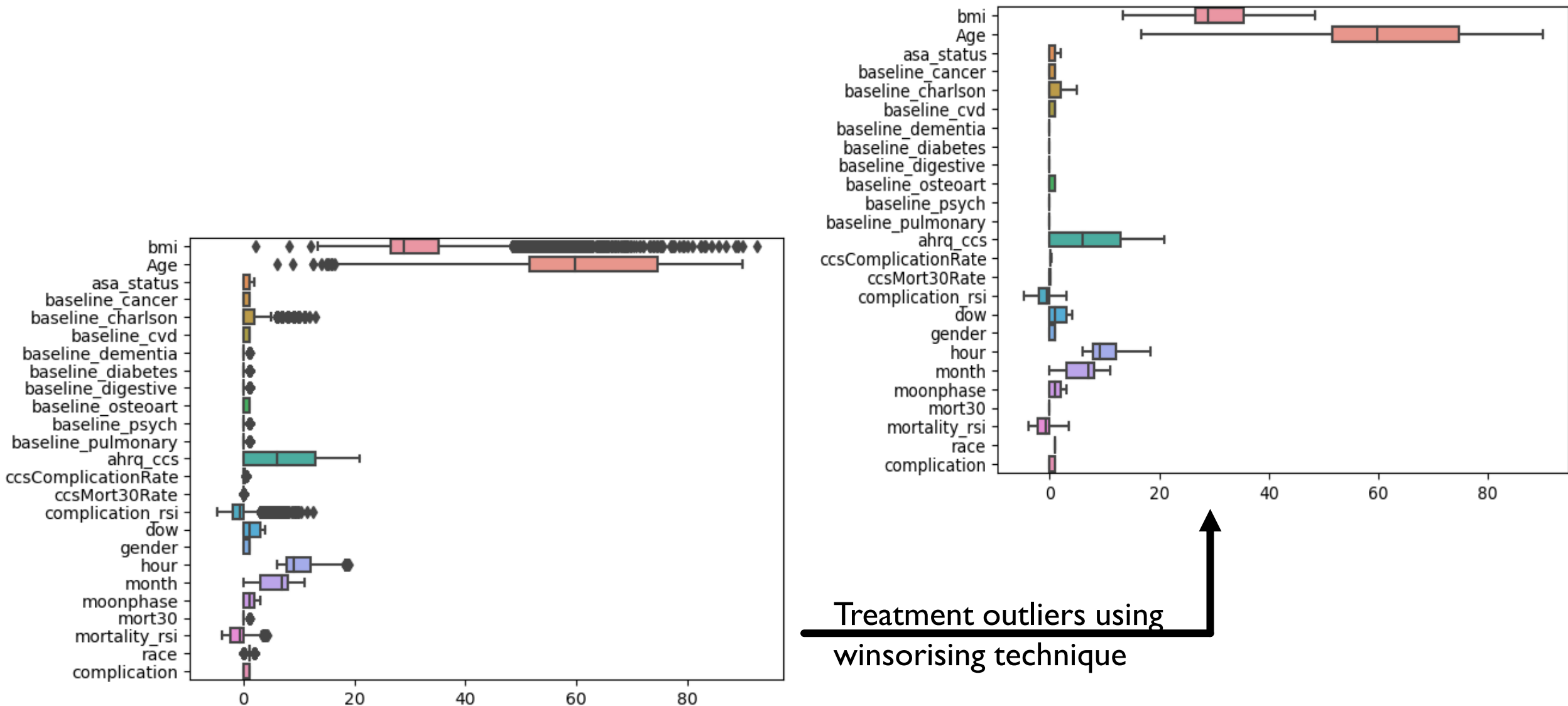
DATA DESCRIPTION

- **bmi**: Body mass Index
- **Age**:
- **mortality_rsi**: The Mortality Risk Stratification Index (RSI)
- **mort30**: Mortality within 30 days of surgery
- **moonphase**: The moon phase.
- **Month** : month of the year in which surgery is performed.
- **hour**: The time of day at which surgery is performed.
- **gender**:
- **dow**: The day of the week on which surgery is performed.
- **complication_rsi**: The Complication Risk Stratification Index (RSI)
- **ccsMort30Rate**: The 30-day mortality rate based on the Clinical Classifications Software (CCS)
- **ccsComplicationRate**: The rate of postoperative complications based on the Clinical Classifications Software (CCS)
- **ahrq_ccs**: The Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications Software (CCS)
- **baseline_pulmonary**: Baseline pulmonary disease.
- **baseline_psych**: Baseline psychological conditions
- **baseline_osteoart**: Baseline osteoarthritis.
- **baseline_digestive**: Baseline digestive disease
- **baseline_diabetes**: Baseline diabetes.
- **baseline_dementia**: diagnosis of dementia
- **baseline_cvd**: history of cardiovascular disease (CVD)
- **baseline_charlson**: The Charlson Comorbidity Index (CCI) is a measure of a patient's overall health status
- **baseline_cancer** : diagnosis of cancer prior to surgery.
- **asa_status**: The American Society of Anesthesiologists (ASA) physical status
- **race**: Ethnicity

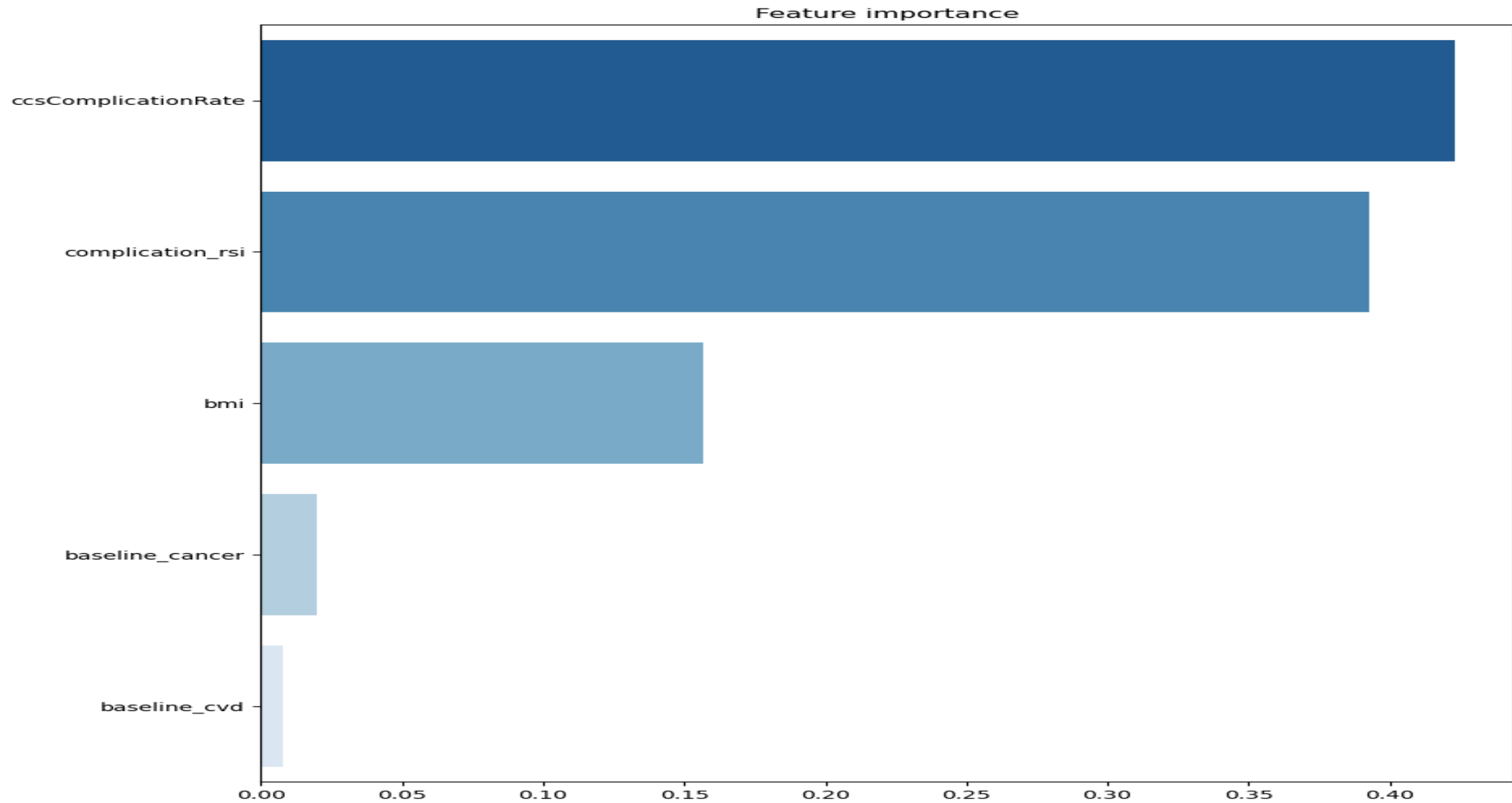
DATA PRE-PROCESSING

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14635 entries, 0 to 14634
Data columns (total 25 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   bmi                                    14635 non-null  float64
1   Age                                    14635 non-null  float64
2   asa_status                            14635 non-null  int64
3   baseline_cancer                       14635 non-null  int64
4   baseline_charlson                     14635 non-null  int64
5   baseline_cvd                           14635 non-null  int64
6   baseline_dementia                     14635 non-null  int64
7   baseline_diabetes                     14635 non-null  int64
8   baseline_digestive                    14635 non-null  int64
9   baseline_osteoart                     14635 non-null  int64
10  baseline_psych                         14635 non-null  int64
11  baseline_pulmonary                    14635 non-null  int64
12  ahrq_ccs                              14635 non-null  int64
13  ccsComplicationRate                   14635 non-null  float64
14  ccsMort30Rate                         14635 non-null  float64
15  complication_rsi                      14635 non-null  float64
16  dow                                    14635 non-null  int64
17  gender                                14635 non-null  int64
18  hour                                    14635 non-null  float64
19  month                                  14635 non-null  int64
20  moonphase                             14635 non-null  int64
21  mort30                                 14635 non-null  int64
22  mortality_rsi                         14635 non-null  float64
23  race                                    14635 non-null  int64
24  complication                           14635 non-null  int64
dtypes: float64(7), int64(18)
```


CHECKING AND TREATMENT OF OUTLIER

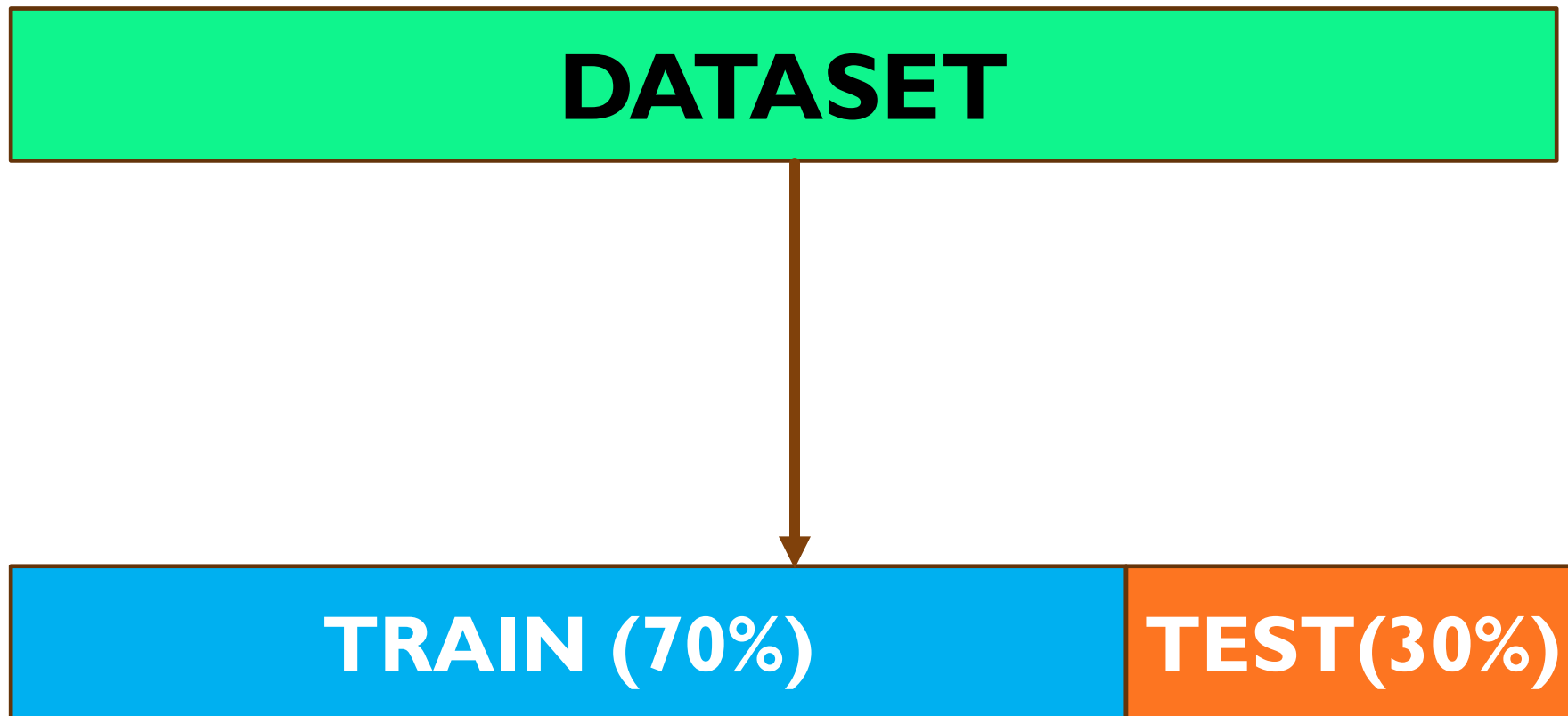


IMPORTANT FEATURES

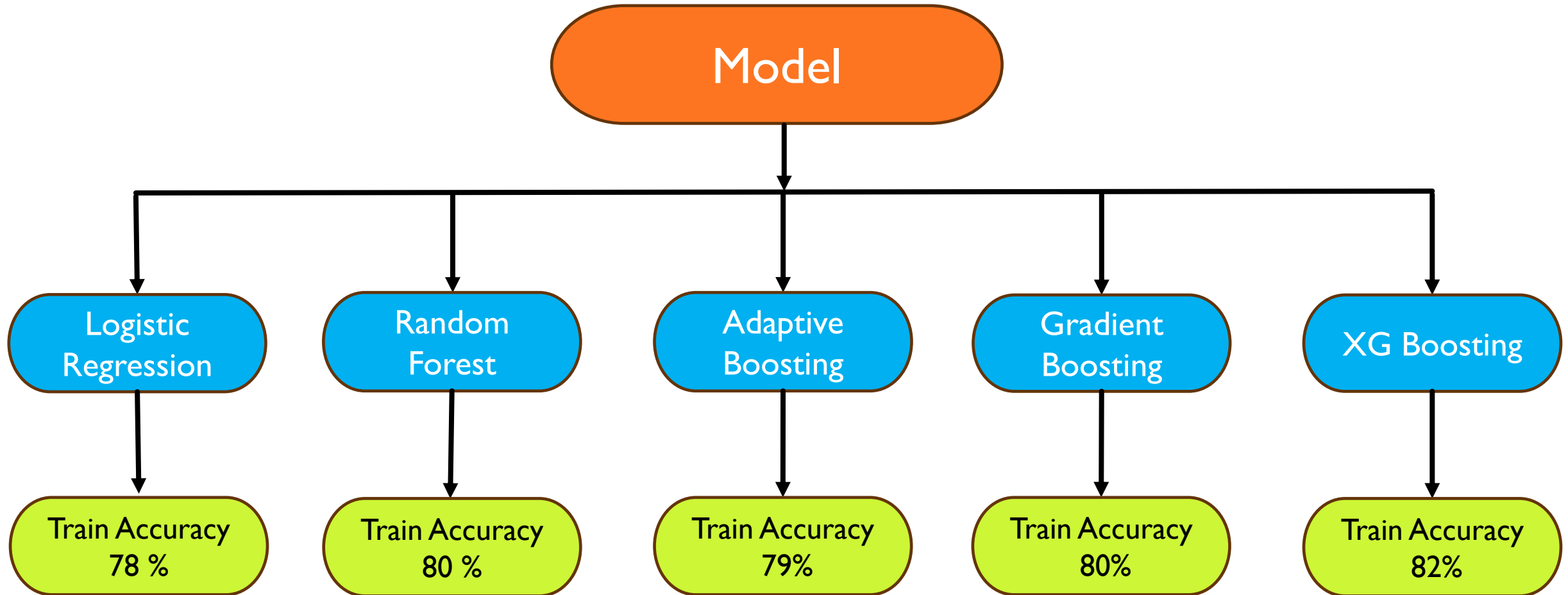


CCSCOMPLICATIONRATE > COMPLICATION_RSI > BMI > BASELINE_CANCER > BASELINE_CVD

SPLITTING : DIVIDING DATA INTO TRAIN AND TEST



MODEL BUILDING



MODEL SELECTION

Sr No.	Model	Accuracy(Train)
1.	Logistic Regression	78%
2.	Random Forest	80%
3.	Adaptive Boosting	79%
4.	Gradient Boosting	80%
5.	Extreme Gradient Boosting	82%

Here we select Xg boosting as a best model with high Accuracy

CONCLUSION

- *We can simplify the analysis by focusing on the top 5 important features that are most predictive of the surgical complications. This will allow us to identify the key factors that we can address to reduce the likelihood of complications for patients undergoing surgery.*
- *We can further investigate these features and identify strategies to mitigate the risks associated with them. By focusing on these important features, we can prioritize our efforts to improve patient outcomes after surgery.*
- *This project opens the door to early identification and intervention, potentially reducing the overall risk and impact of post-operative complications. It has the potential to improve patient outcomes, optimize healthcare resource allocation, and contribute to more personalized and effective medical care. With further advancements in machine learning techniques and the availability of larger and more diverse datasets, the potential impact of this models is expected to grow even further.*

THANK YOU

