Electrode Impedance Prediction using Microsoft Azure Machine Learning

We developed the ML Models using Microsoft Azure Machine Learning.

It's a visual programming tool where there is no need to write textual source code.

We did many experiments that started by selecting columns in the Dataset as in fig 1.
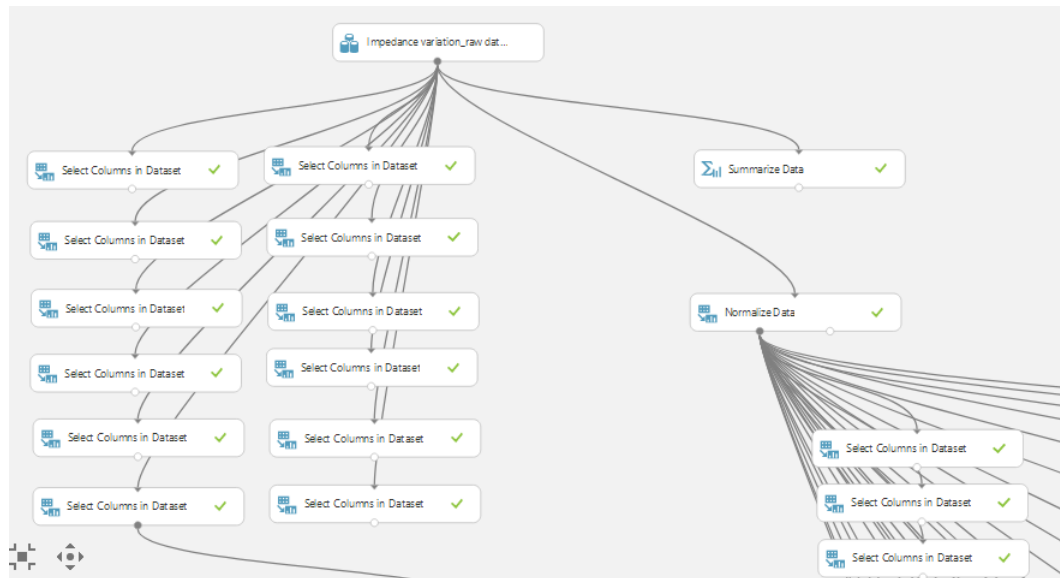

Fig1. Selecting columns in the Dataset

Then we split our data and train the models as shown in Figure 2.

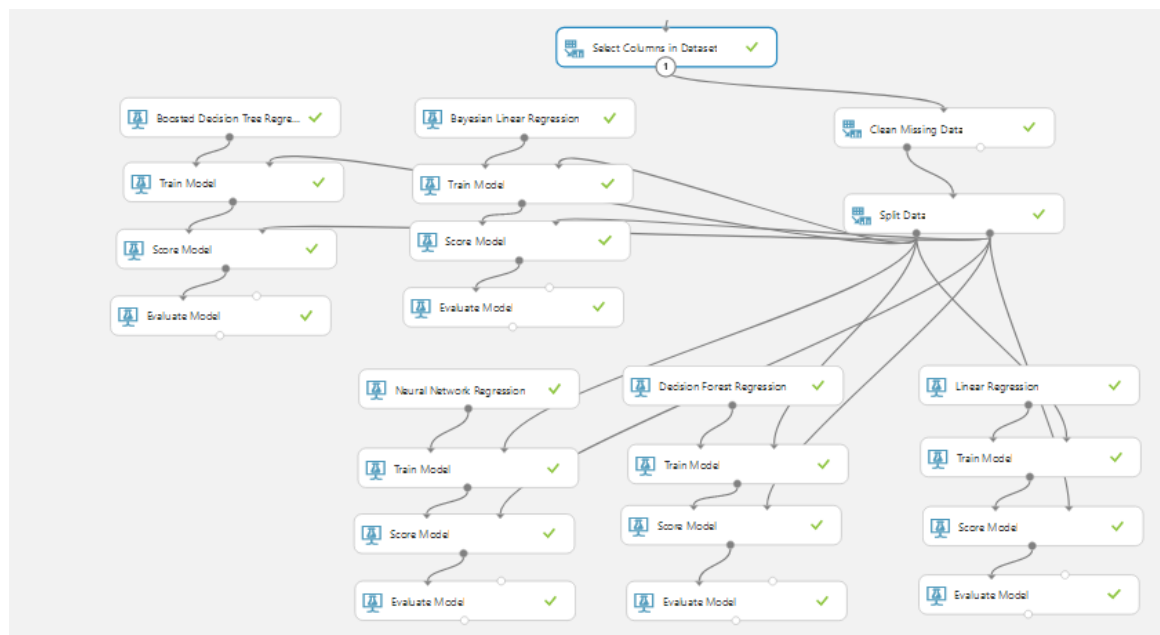Where we created five models based on five different algorithms.

Fig. 2 Training and evaluating the models

In table 1. We demonstrates the hyperparameters used for each algorithm.

Table1. Hyperparameters

Index	Algorithm	Hyperparameter	Value
1	Neural Network Regression	Hidden layer specification	Fully connected case
2	Neural Network Regression	Number of hidden nodes	100
3	Neural Network Regression	Learning Rate	0.005
4	Neural Network Regression	Number of learning iterations	100
5	Neural Network Regression	The type of normalizer	Min-Max normalizer
6	Decision Forest Regression	Resampling method	Bagging
7	Decision Forest Regression	Number of decision trees	8
8	Decision Forest Regression	Maximum depth of the decision trees	32
9	Decision Forest Regression	Number of random splits per node	128
10	Decision Forest Regression	Minimum number of samples per leaf node	1
11	Boosted Decision Tree Regression	Maximum number of leavers per tree	20
12	Boosted Decision Tree Regression	Minimum number of samples per leaf node	10
13	Boosted Decision Tree Regression	Learning Rate	0.2
14	Boosted Decision Tree Regression	Total number of trees constructed	100
15	Linear Regression	Solution method	Ordinary Least Squares
16	Linear Regression	L2 regularization weight	0.001
17	Bayesian Linear Regression	Regularization weight	1
18	Bayesian Linear Regression	Allow unknown categorical levels	True