**ML ML:**

Input:

Dataset

Pocess:

1. Select a k-fold split of the training dataset.
2. Select m base-models.
3. For each basemodel:
4. Evaluate using k-fold cross-validation.
5. Store all out-of-fold predictions.
6. Fit the model on the full training dataset and store.
7. Fit a meta-model on the out-of-fold predictions.
8. Evaluate the model on a holdout dataset or use model to make predictions.

Output:

Ensemble model

**DAE+XGboost**

Notation:

Si: reconstruction coefficient for xi.

Input :

dataset D= {xi}

Process:

1. For each epoch:
   1. For each sample:
2. Compute the Si for train example{xi}
3. Minimize the cost function by stochastic gradient descent.
4. Compute Yi for each input
5. Predict all the dataset.
6. Train xgboost using outputs of DAE.

Output:

DAE model + XGboost model

**DAE+MLP (also DAE+CNN)**

Notion:

Si: reconstruction coefficient for xi.

Input :

dataset D= {xi}

Process:

1. For each epoch:
   1. For each sample:
2. sCompute the Si for train example{xi}
3. Minimize the cost function by stochastic gradient descent.
4. Compute Yi for each input

Output:

Ensemble model