

## Exercise 4: The training set

In this exercise we will experiment with the geometry and cardinality of the training set, and with the way the training points are presented to the algorithm (before proceeding with the exercise, close the notebook and re-open the original one from the website or reset the parameters to their default values).

The parameters that determine these features are collected in one of the pink-colored cells

### Define the training set

```
numberOfTrainingPoints = 1000;
numberOfRepetitions = 5;

trainingPointList = uniformRandomTrainingPointList [
    numberOfTrainingPoints,
    inputRange
];
```

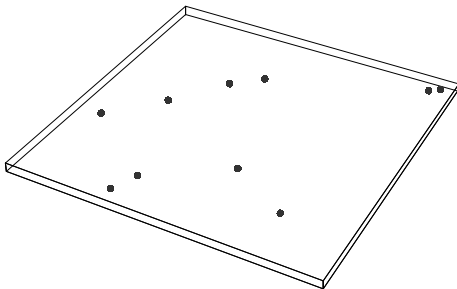
Here you can set the number of training points and the number of times the training point is used by the algorithm.

Experiment with these values.

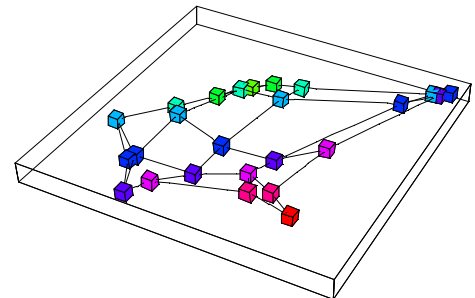
```
numberOfTrainingPoints = 10;
numberOfRepetitions = 500;
```

For example, observe and interpret what happens when you present many times a small set of training points.

Distribution of training points

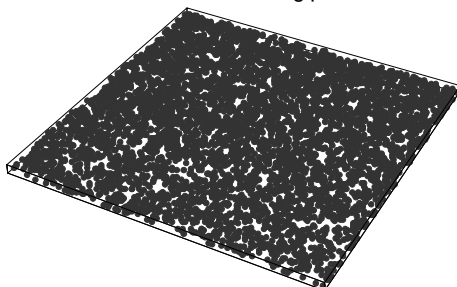


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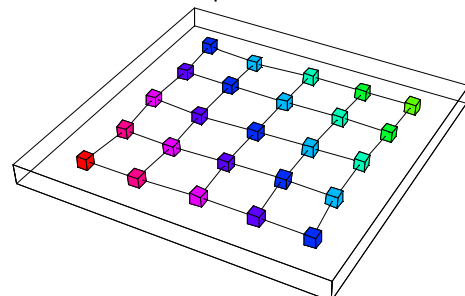


```
numberOfTrainingPoints = 5000;
numberOfRepetitions = 1;
```

Distribution of training points



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You can also modify the distribution of the training points in the input space

## Define the training set

Define the following training set generating procedures:

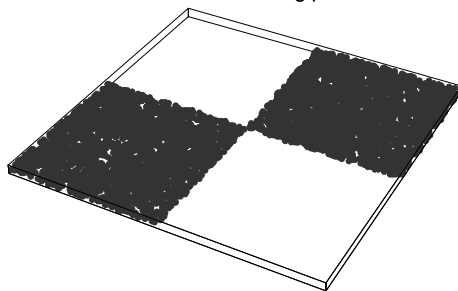
```
uniformRandomTrainingPointList
blockRandomTrainingPointList
interspersedBlockRandomTrainingPointList
hollowEllipsoidRandomTrainingPointList
```

```
numberOfTrainingPoints = 5000;
numberOfRepetitions = 1;

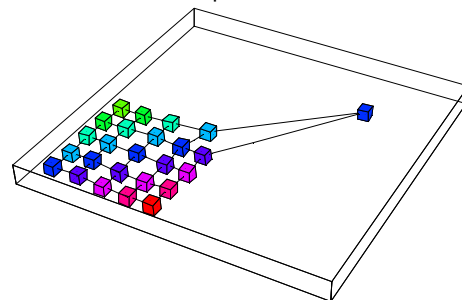
trainingPointList = blockRandomTrainingPointList [
    numberOfTrainingPoints,
    inputRange
];
```

Try selecting a different generating procedure and interpret the ensuing effects.

Distribution of training points



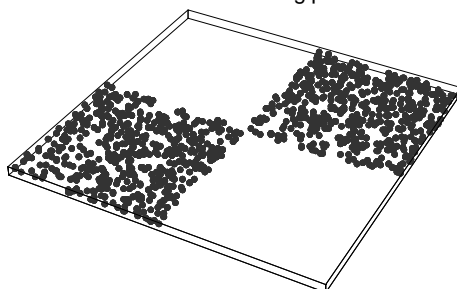
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```
numberOfTrainingPoints = 1000;
numberOfRepetitions = 5;

trainingPointList = blockRandomTrainingPointList [
    numberOfTrainingPoints,
    inputRange
];
```

Distribution of training points



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