

Exercise 3: The geometry of the input and output spaces

In this exercise we will experiment with the geometry of the input and output spaces.

Before proceeding, close the notebook and reopen the original one from the website or reset the parameters of the neighborhood and learning functions to their default values.

In the previous exercises we used a bi-dimensional input space (where the set of training points “lives”) and a 5x5 bi-dimensional lattice of neurons. The parameters that determine these features are collected in another pink-colored cell

Set the geometry of input and output spaces

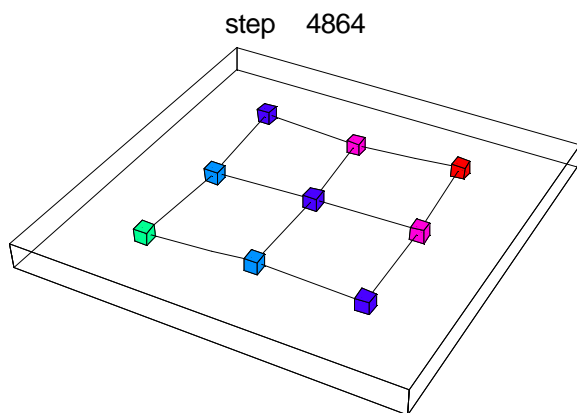
```
setGeometricParameters [
  dimInputSpace → 2,
  numRowsOutputSpace → 5,
  numColumnsOutputSpace → 5,
  numPlanesOutputSpace → 1
];

inputRange = Table[{0, 1}, {i, 1, dimInputSpace[]}];
```

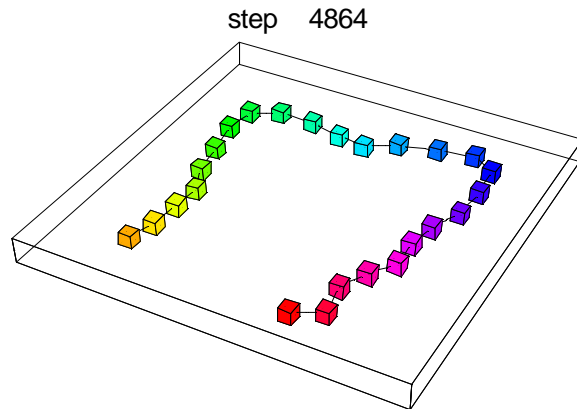
```
setGeometricParameters [
  dimInputSpace → 2,
  numRowsOutputSpace → 10,
  numColumnsOutputSpace → 10,
  numPlanesOutputSpace → 1
];

inputRange = Table[{0, 1}, {i, 1, dimInputSpace[]}];
```

You can experiment with integer values of **dimInputSpace** varying from 1 to 3, and with positive integer values of the number of Rows, Columns, and Planes of the output space (but consider that the computation and memory requirements of the algorithm grow rapidly with these latter values).

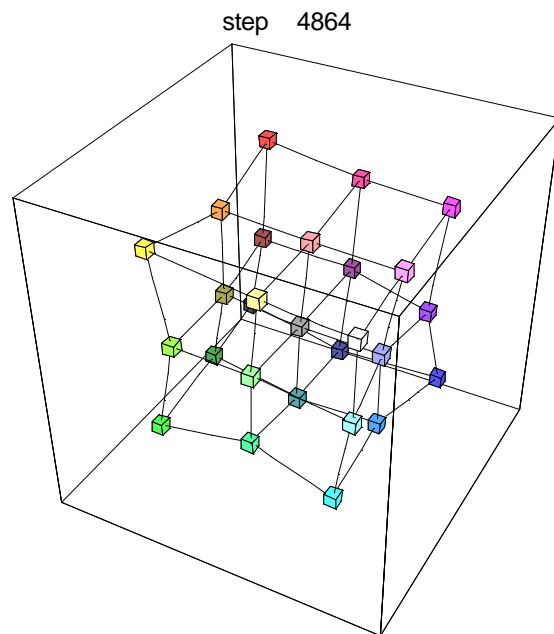
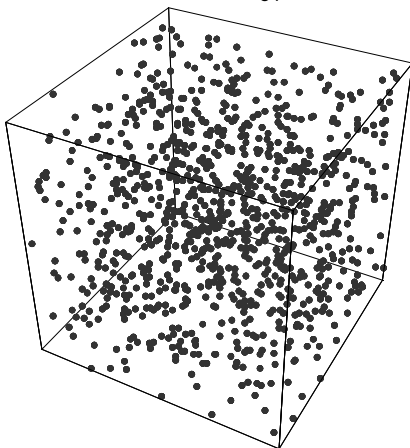


```
setGeometricParameters [
  dimInputSpace → 2,
  numRowsOutputSpace → 25,
  numColumnsOutputSpace → 1,
  numPlanesOutputSpace → 1
];
```



```
setGeometricParameters [
  dimInputSpace → 3,
  numRowsOutputSpace → 3,
  numColumnsOutputSpace → 3,
  numPlanesOutputSpace → 3
];
```

Distribution of training points



```
setGeometricParameters [
  dimInputSpace → 3,
  numRowsOutputSpace → 10,
  numColumnsOutputSpace → 4,
  numPlanesOutputSpace → 1
];
```

