## 2.2 Artificial Intelligence

So far, the factory is controlled by a PLC software. This software allows the developer to set clear instructions what the factory and each machine does. Instructions are worked through precisely.

However, for a neuronal network that’s not the case. A program receives a set of data that reflect small entities of the factory. The program then needs to find connections and recognize patterns between the entities.

The factory is supposed to be monitored and controlled by Artificial Intelligence. While AI comprehend many ways of implementations, this project is supposed to use neuronal networks. This chapter will review neuronal networks.

### 2.2.1 Neuronal Network in general

**“What fires together, wires together”** (Hebb, 1949) can be seen as neuronal networks slogan. The quote represents the idea how a neuronal network is built. The interesting thing is the contestation that hitting will ultimately connect.

The idea of a neuronal network is to create software that works similar like a human brain. Therefor components of the brain are rebuilt. The network consists of many small entities, that are similar like the neurons. The elements are interconnected to each other, like synapses.

When raw data is put in a new system, there is no connection between the entities. The computer then need to find connections. Hebb is describing the idea of how it’s done: Data often colliding, will have some kind of link.

The challenge is to provide the computer with the information. For Human it is often easy to acquire a series of data, not for a computer.

It is required to provide as much raw data as possible, without giving many rule bases.

### 2.2.2 Convolutional Neuronal Network

It is based on the mathematical convolution.

Receives its data through a input layer. Publicizes data through a output layer.

### 2.2.3 Recurrent Neuronal Network