Further information on lesson 1

Introduction to supervised learning: from examples to AI systems

Machine learning, or more specifically supervised learning, is used to classify objects as follows. Various example objects are recorded and marked with labels. A label is a label that indicates which class this example belongs to. For example, photos of cats are given the label "cat" and those of dogs the label "dog", depending on what is to be recognized in the image. Each photo also has different, digitally represented properties, which are described by characteristics and can be differently pronounced. (Note: The characteristics that a person assigns to a photo are different from the digital characteristics. A photo has characteristics, such as color values of individual pixels, which are used in an mL process to create a rule system. To simplify matters, we only talk to students about "the" photo). Machine learning is used to create a rule system based on the characteristics of the objects, which assigns the objects to the appropriate, predefined labels. Such a finished rule system is referred to as an AI or AI system. An automated AI creation process is then called machine learning.

Possibility of deepening the topic of image recognition:

Beautifully prepared video that deepens image recognition:

<https://www.youtube.com/watch?v=HmUzceKCI9I&list=PL4puIg9yEU6yn_XR0TiSLroYO3KAlZmYY&t=1s>

AI systems can be used to classify images, for example, to determine whether a dog or a cat can be seen. Machine learning makes it possible to create such AI systems on the basis of training data with dog and cat images.

Possible metaphor: You can recognize certain parallels between machine learning and the learning process of small children. Children learn by us showing them objects, saying their names and repeating everything until they can distinguish dogs from cats. For example, when dogs meet, adults say "dog" and cats say "cat" often enough that the child eventually learns what is a cat and what is a dog. Through prediction and correction.

The provision of examples and the appropriate solution is also used in machine learning. The examples are saved as data (e.g. photos of dogs or cats) and provided with a suitable label containing the correct solution.

Decision trees as AI systems for data-based decision-making

A decision tree is one possible form of what is called an AI or AI system. A decision tree suggests a decision; it can be used to classify objects. The decision tree indicates whether something is recommended or not. However, the decision tree is not "intelligent", but has been trained on the corresponding rule system using data. This does not mean that the computer "knows" or "understands" what is recommendable, but only that it evaluates data and (can) make classifications based on it.

A possible application (other than the food classification system used here in the series of lessons) for decision trees is personalized advertising on online platforms. The target feature here is to predict whether a person will like a product, a movie, etc., for example. Data is collected on various characteristics of individual people's behavior. These characteristics are then used to establish decision rules, similar to the nutritional information in the series of lessons. Data from many users is then used to create suitable decision models that attempt to predict who will like a product and then display it to them.