



ARTIN FUTURE PROJECT

Module 2

Unit 2.1: How do humans learn and how do machines learn?

Developed by:  TECHNISCHE
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Module 2 | Unit 2.1



Total estimated time:	~ 90 min.
Task:	<ul style="list-style-type: none">• Present essential differences between machine and human learning.• Explain how machine learning works

Learning objectives	
Educators:	Know how neuronal networks allow a human brain to learn
	Know how machines learn via algorithms
Students:	Know how machines learn



Schedule:

Unit part	Estimated Time	Target group	Approach	Content description depending on Level / Age	Materials (Links, Worksheets, etc.)
Add	15 min		Approach according to choice from previous module	<p>Summary review of Module 1 A short review or summary of the contents of Module 1. If necessary, a repetition of individual Units/Unit parts from module 1. e.g.:</p> <ul style="list-style-type: none"> • <i>Why using AI? - Motivational aspects</i> • <i>What is AI? - Definition and differentiation</i> • <i>How to AI? - Ethical standards and principles</i> 	
Intro	30 min	PS/ GS/ HS/ AE	LingA	<p>Introductory talk with targeted questions Learners answer a series of questions related to human learning: e.g.:</p> <ul style="list-style-type: none"> • <i>What did you learn last week?</i> • <i>Why do people learn?</i> • <i>Can other living things also learn?</i> • <i>What does it mean to learn?</i> • <i>What is the best way to learn?</i> 	Worksheet_2.1_01
	15 min	GS/ HS/ AE	AbstrA	<p>Introductory talk with targeted and in-depth questions Learners answer a series of questions related to human learning. e.g. as seen above</p>	



				<p><i>Additional/Optional:</i> Learners think more intensively about the last question. To do this, they work through the material Afterwards, it can be discussed with the learners what the prerequisites are for machines to learn and whether they are similar to human learning.</p>	
Dev	30 min	PS	HaptA	<p>Playful Introduction into image recognition - Memory cards Students are given a set of memory cards in teams of 2. They play classic memory, but the pairs are not exactly the same, but are only from the same category of objects (e.g. traffic lights, bridges, palm trees etc. - as with the picture captchas on the net).</p> <p>This can already be used as an introduction to what machines are guided by when they have to sort pictures into the same category or recognise objects on pictures.</p>	Material_2.1_02a
		GS/ HS/ AE	LingA AbstrA	<p>Playful Introduction into Image recognition - Image taboo <i>The students try to give an accurate description of a picture with the help of picture cards. They try to analyse the pictures like a computer. Students should strictly adhere to using only the following descriptive elements: Position, Shape, Colour</i></p> <p><i>Alternative:</i> A picture description is given and the students try to find the picture described by guessing.</p>	
Recap	15 min	GS/ HS/ AE	LingA	<p>Evaluation of the experience Retrospective and summary talk about the experiences from the unit. Concluding with summarising statements on machine learning: e.g.:</p>	



				<ul style="list-style-type: none"> • <i>Image recognition is a possible field of application for machine learning.</i> • <i>Machine learning applications can learn to distinguish objects from each other.</i> • <i>To do this, they can receive training data that are assigned to the correct labels in advance.</i> • <i>They recognise patterns in the training data and build an internal model from the training data.</i> • <i>The more different the training data are, the better (e.g. from different angles, different lighting conditions).</i> • <i>The more training data, the better. (Note: this does not apply to all learning methods, but in this context this statement should suffice).</i> • <i>The probability of a correct assignment increases with experience from the training data presented.</i> • <i>The assignments can be wrong and still need human feedback, especially at the beginning.</i> 	
Add	15 min		Approach according to choice from previous module	<p>Summary review of Module 1 A short review or summary of the contents of Module 1. If necessary, a repetition of individual Units/Unit parts from module 1. e.g.:</p> <ul style="list-style-type: none"> • <i>Why using AI? - Motivational aspects</i> • <i>What is AI? - Definition and differentiation</i> • <i>How to AI? - Ethical standards and principles</i> 	