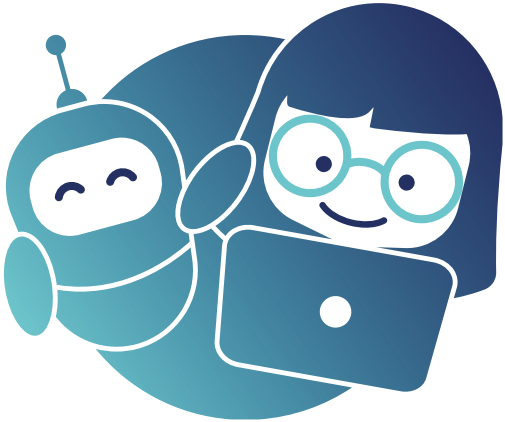
5 I'm not a Robot



Toolbox #5

How clever is a robot?

5

Introduction

What is this about?

If robots and AI-controlled devices are to act meaningfully in everyday life, how do they know what to do? Are they told what to do all the time? Do they always carry out the instructions without thinking independently? Instead, are machines also able to learn, and if so, how does this learning take place? Can a robot use what it has learned to react flexibly to situations? The educational professionals support the children in their thinking about the question of how robots and AI-controlled devices learn and how cleverly the machines can interact?

Children‘s point of view

What is the difference about coding a robot and deep learning and artificial intelligence?

Questions from Children

Is a robot smarter than I am?
Can I trick a robot and how does it work?
How can I teach a robot to clean my room?

5 What we know

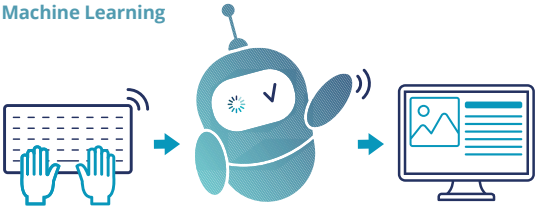
Linguistic dimension

Firstly, it should be clarified with the children what is meant by calling somebody or even something smart oder clever. Is somebody clever who knows al lot? Does smart mean being good at cheating? Do they kow the colloquial sayings: “clever as a crow” or “clever as a pig”? The point is to understand what children mean by smart and how they would describe a smart robot

Mathematical scientific level

Data collection: counting, ordering, representing/displaying
Combinatorics: sorting, reassembling, pattern recognition
Machine learning, deep learning
Algorithm + abstraction, whereby humans cannot interpret individual „learning steps“

Machine Learning



Data Input

Algorithm + Methods

- Connections
- Model
- Dependences
- Hidden Structure

Data Output

5

Goals

Pedagogical professionals

Mathematical scientific knowledge
Review and expansion of knowledge base.

Design of learning environments
Design work spaces to promote systematic thinking.
Explore stuctures and patterns in nature and arts
Foster problemsolving referring to their own mental images.

Children

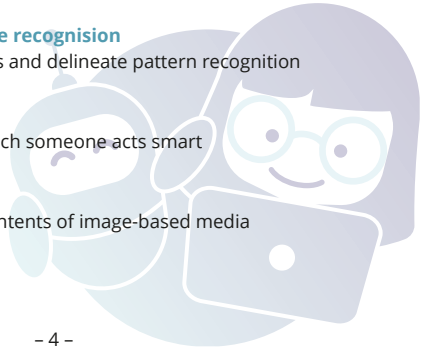
Linguistic skills
Distinguish between clever, smart and intelligent

Limitations
Recognise the limits of a robot's cleverness

Pattern and structure recognision
Identifyng structures and delineate pattern recognition

Story telling
Create stories in which someone acts smart

Media competence
Reflect on critical contents of image-based media



5 Exercise

Level ● ○

Matching colours & shapes

Materials

Tablet + APP Preschool

Learning games for toddlers 2+ 4+
Kids games for 3,4,5 year olds
Bimi Boo Kids Learning Games for Toddlers FZ LLC

Preparation

Charge the tablet and download the apps in advance. Read the description of the app and think about how to introduce this game. The children should play individually against the app.

Implementation

The app will help the child to sort all kinds of geometric shapes and colours, such as vegetable or fruit. If the wrong vegetable is selected, a sound is given and the piece goes back to the garden. As soon as the child matches the vegetables according to the picture depicted on the basket, the next basket appears and the game continues.

Reflection

Why does the robot (app) know what is right or wrong?

5

Exercise

Level

Muster erkennen, Regeln ableiten

Materials

Sample Pattern Pieces

Preperation

Create different workstations.
There are task cards at each workstation.
On the left hand side, there is the target picture
On the right hand side, the individual pattern pieces needed for the task.

Implementation

Lay out the sample cards.
Clarify with the children how the picture is constructed.
Let the children assemble a picture from the pattern masks.
The correct pattern only emerges when all the cards have been placed on top of each other accordingly.

Reflection

Discuss how knowledge develops from individual experience.
Human teaching develops from trial and error or logical thinking, combining different pieces of knowledge and reasoning.

5 Exercise Level

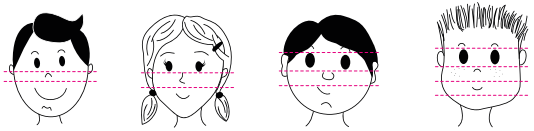
Face Recognition

Materials

Take phots of faces from a magazine or newspaper

Preperation

Cut photos into 3 stripes: forehead + eyes, nose, mouth + chin.
Cut photos into 5 stripes: forehead, eyes, nose, mouth, and chin.



Implementation

Present the mixed-up stripes of faces to all children in a museum walkway.

Ask them why the compilation fit or is not appropriate.
Let the children hypothesise and think about their suggestions together.

Reflection

- Can a robot, an AI recognise a face and parts of a face, for example the eyes?
- How does a robot/an AI do that?
- What does the robot need to recognise this?
- Try out a mobile phone/tablet with face recognition
  Can any face unlock the phone or only the owners?
- Which robots/AIs have a face recognition sensor?

5

Tips for in-depths study

Links

Face Recognition
https://www.eff.org/de/pages/face-recognition

Pattern Recognition
https://www.rfdz-informatik.at/mustererkennung/

Imprint

Toolbox #5 was created in 2022 by Susanne Schumacher, Ulrike Stadler-Altmann, Brigit Brunner, Katrin Crazzolara, Michael Schlauch, Christian Laner, Birgit Pardatscher

VYTAUTAS MAGNUS UNIVERSITY
unibz Fakultät für Bildungswissenschaften Brixen
Facoltà di Scienze della Formazione Bressanone
Facultà de Scienzes dla Formazion Persenon
Børneinstitution Holluf Pile - Tingkær
KLAX

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