

# Was ist Künstliche Intelligenz?

Dr. Stefan Hackstein

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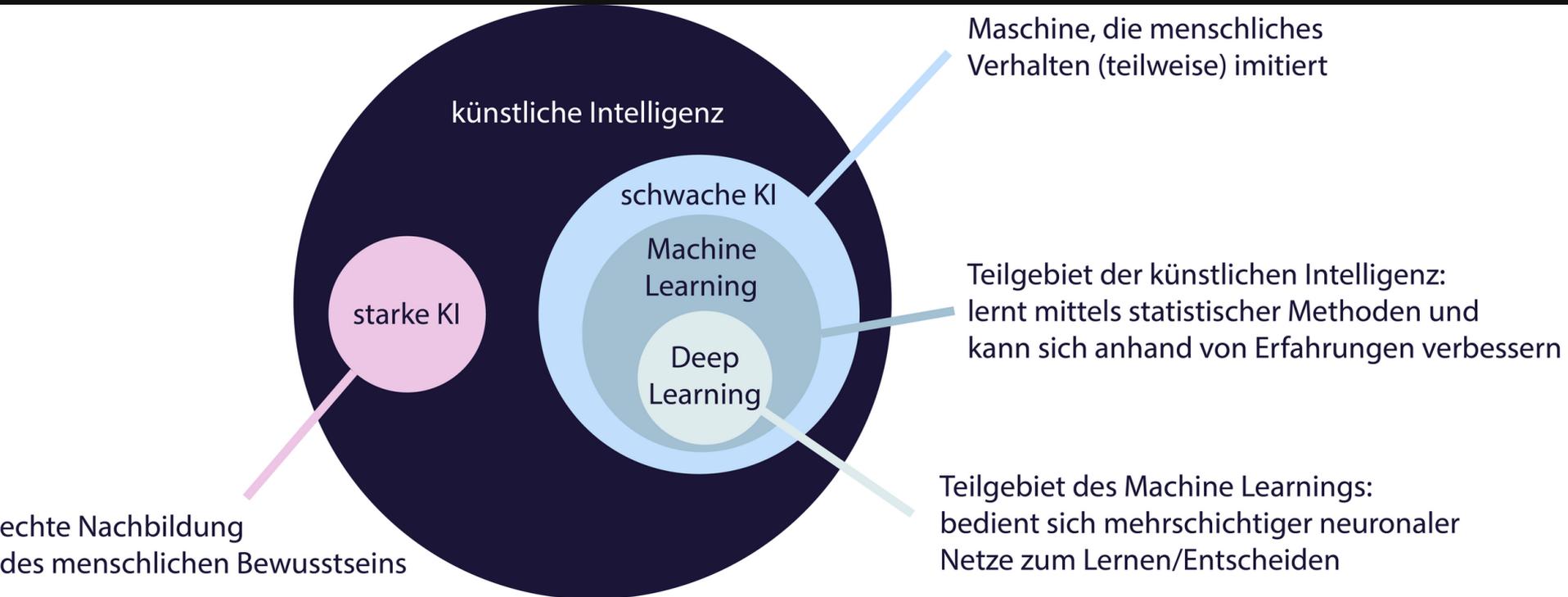
verlorene Wanderergruppe  
ohne Sicht, Kompass, Karte  
Ziel: das richtige Tal



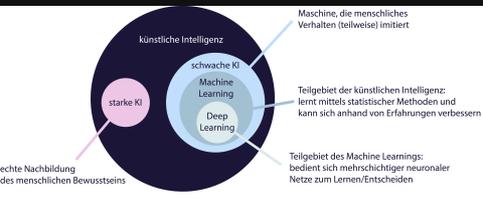
DALL-E

# Was ist Künstliche Intelligenz?

Computer erledigt komplexe Aufgaben



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Computer erledigt komplexe Aufgaben

## Classification



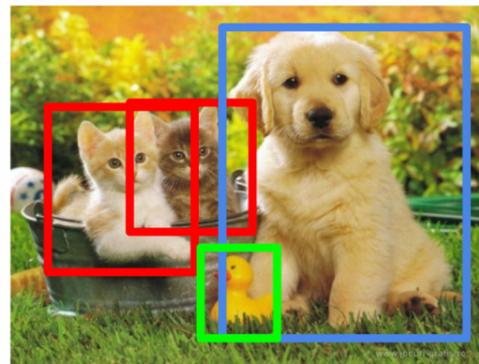
CAT

## Classification + Localization



CAT

## Object Detection



CAT, DOG, DUCK

## Instance Segmentation

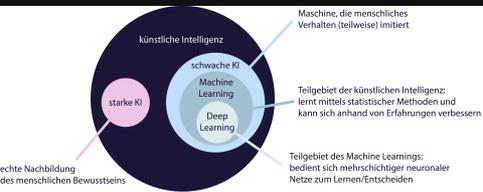


CAT, DOG, DUCK

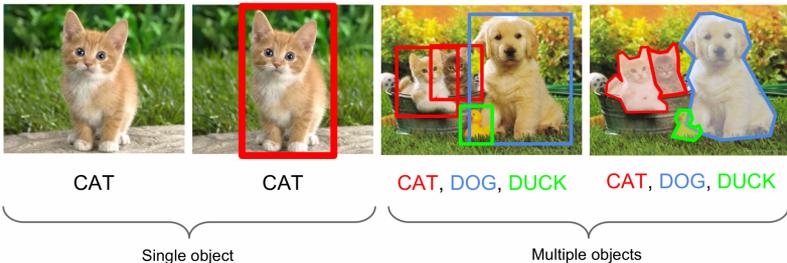
Single object

Multiple objects

# Was ist Künstliche Intelligenz?

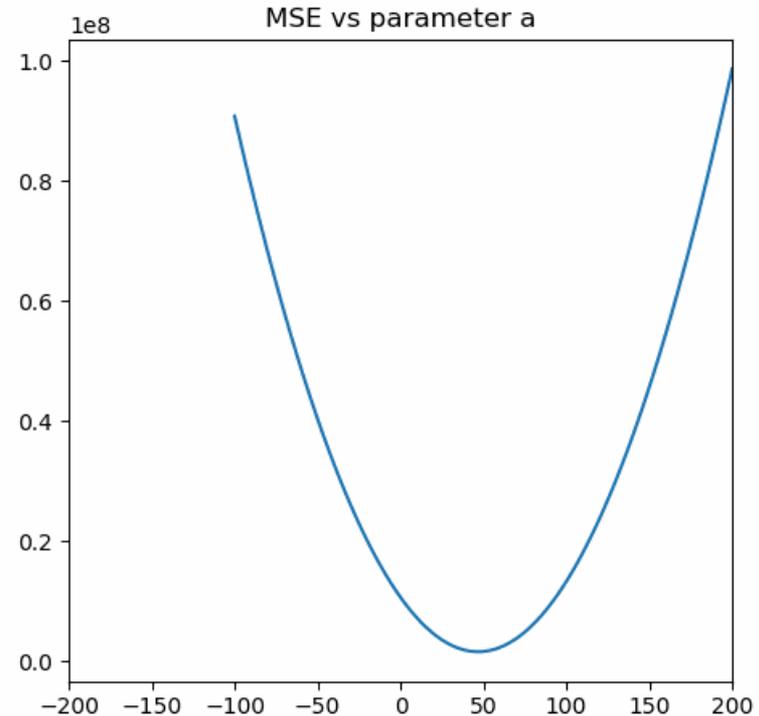
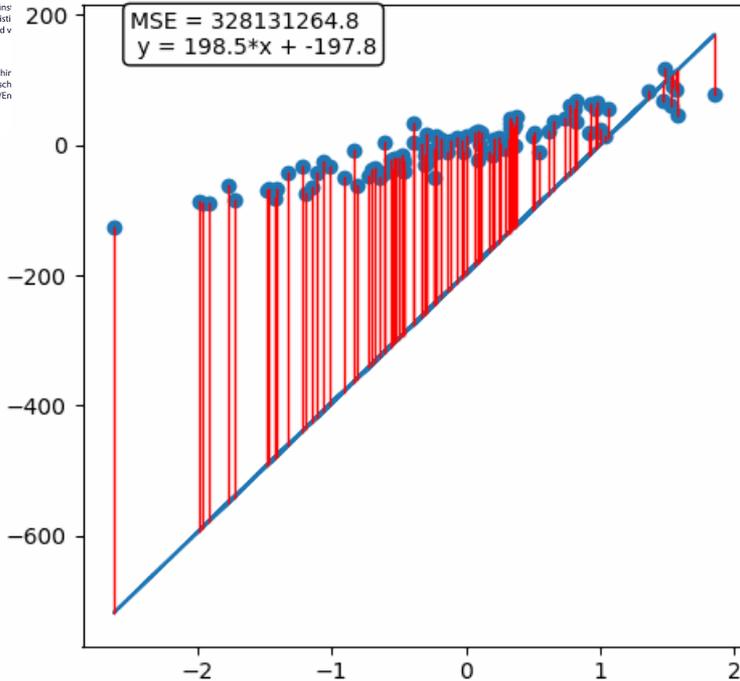
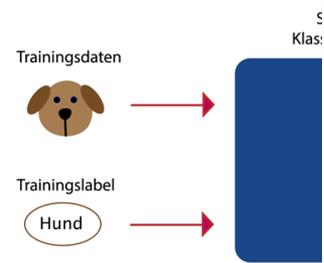
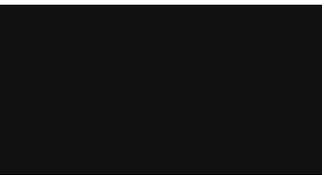
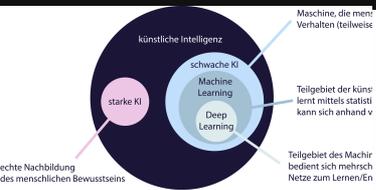


**Classification**      **Classification + Localization**



Gewünschtes Verhalten  
wird trainiert

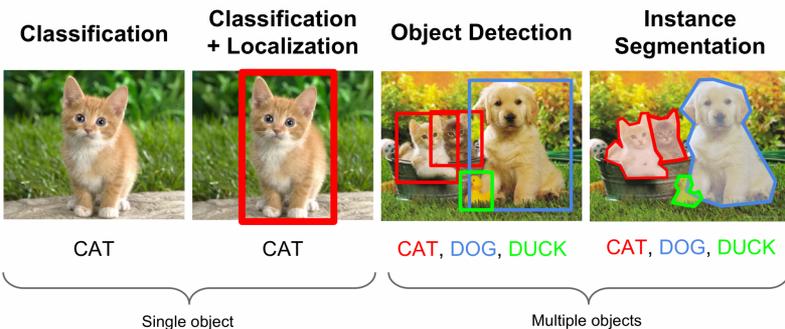
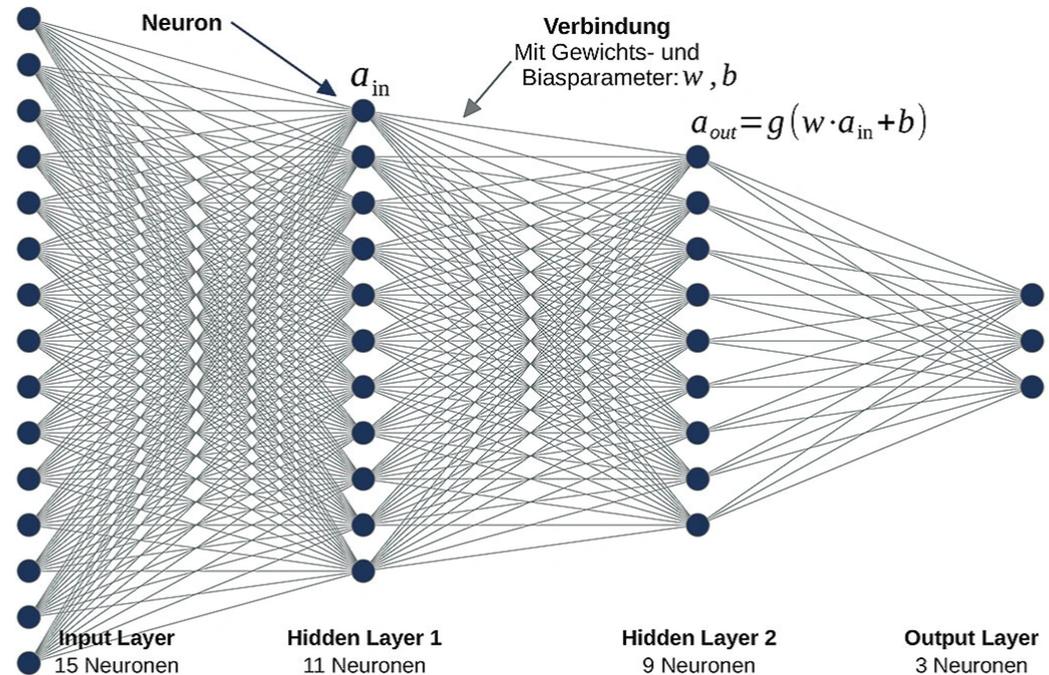
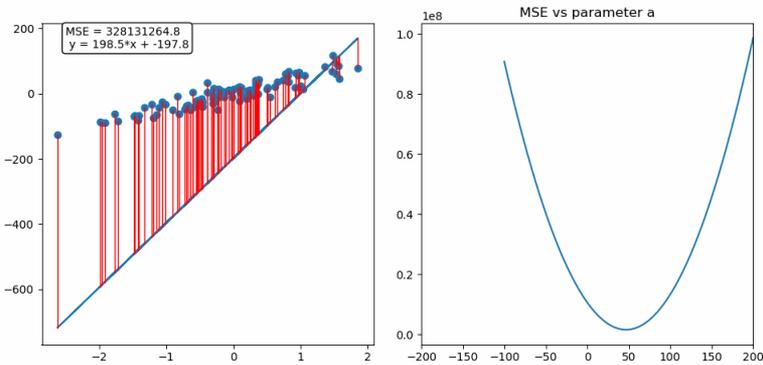
# Was ist Künstliche Intelligenz?



Classification	Classification + Localization	Object Detection	Instance Segmentation
 CAT	 CAT	 CAT, DOG, DUCK	 CAT, DOG, DUCK
Single object		Multiple objects	

Suche nach  
Tal der kleinsten Fehler

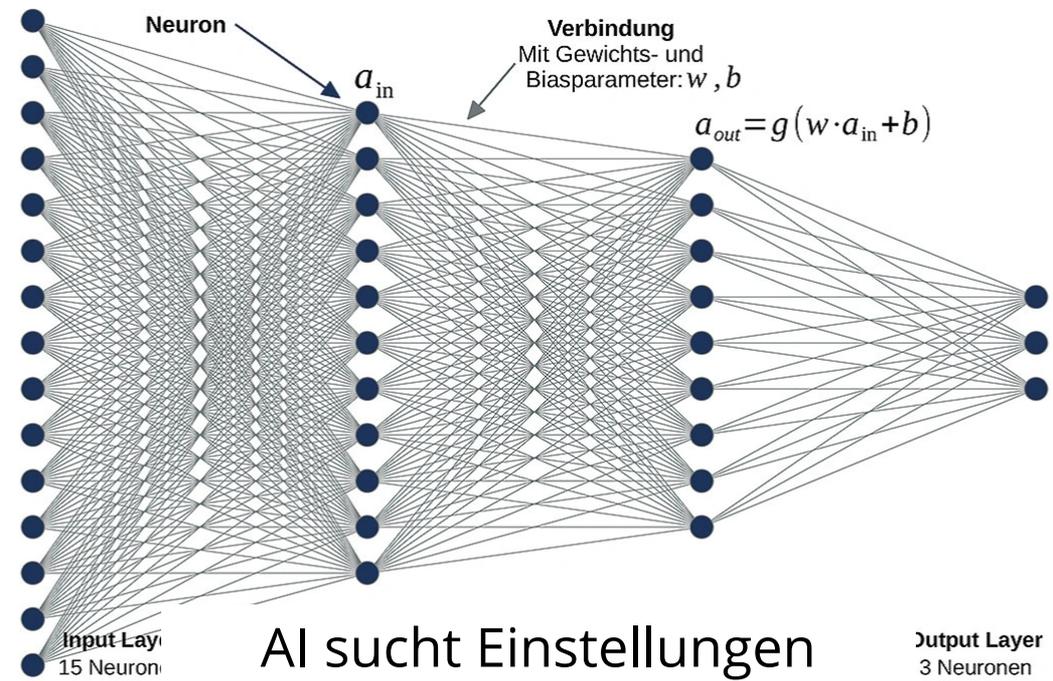
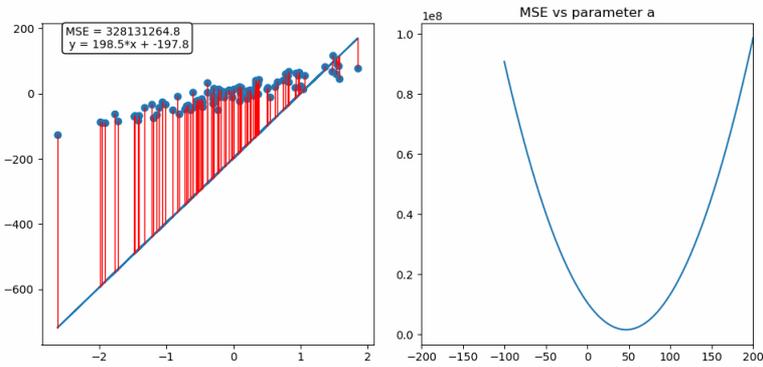
# Was ist Künstliche Intelligenz?



Neuronales Netz

Kompliziertes Netz einfacher Rechnungen

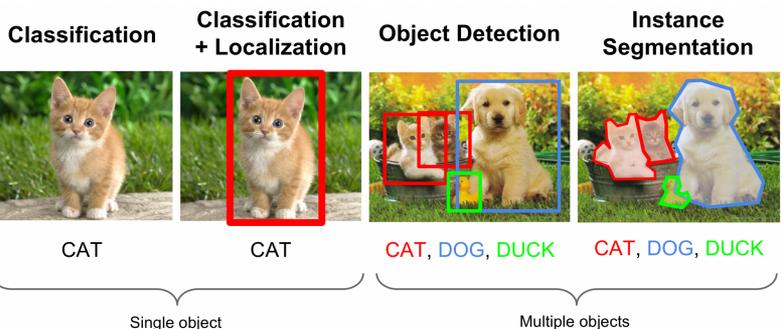
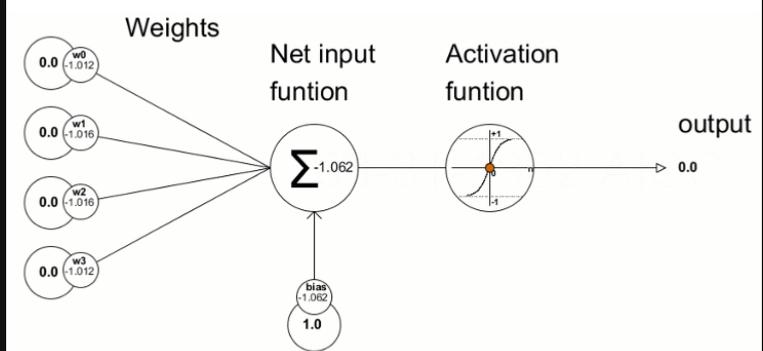
# Was ist Künstliche Intelligenz?



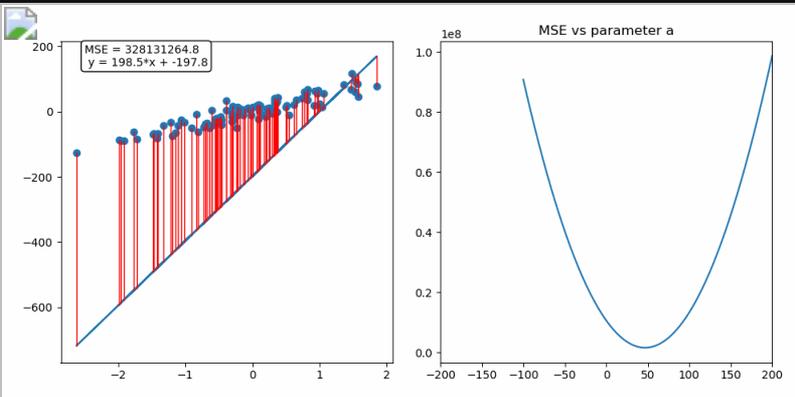
AI sucht Einstellungen



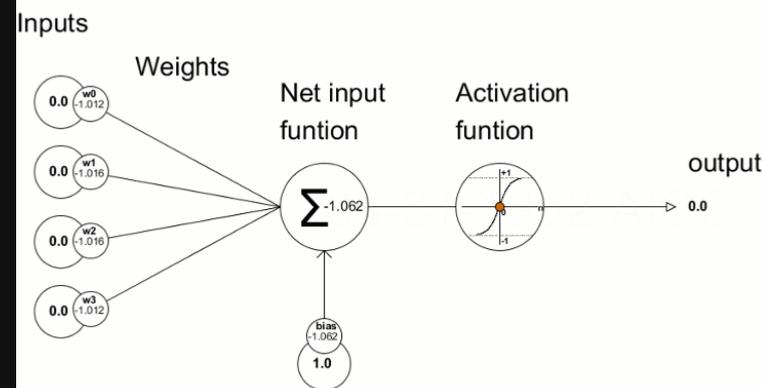
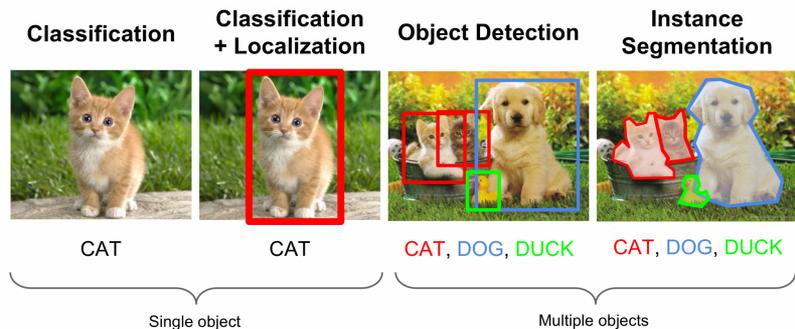
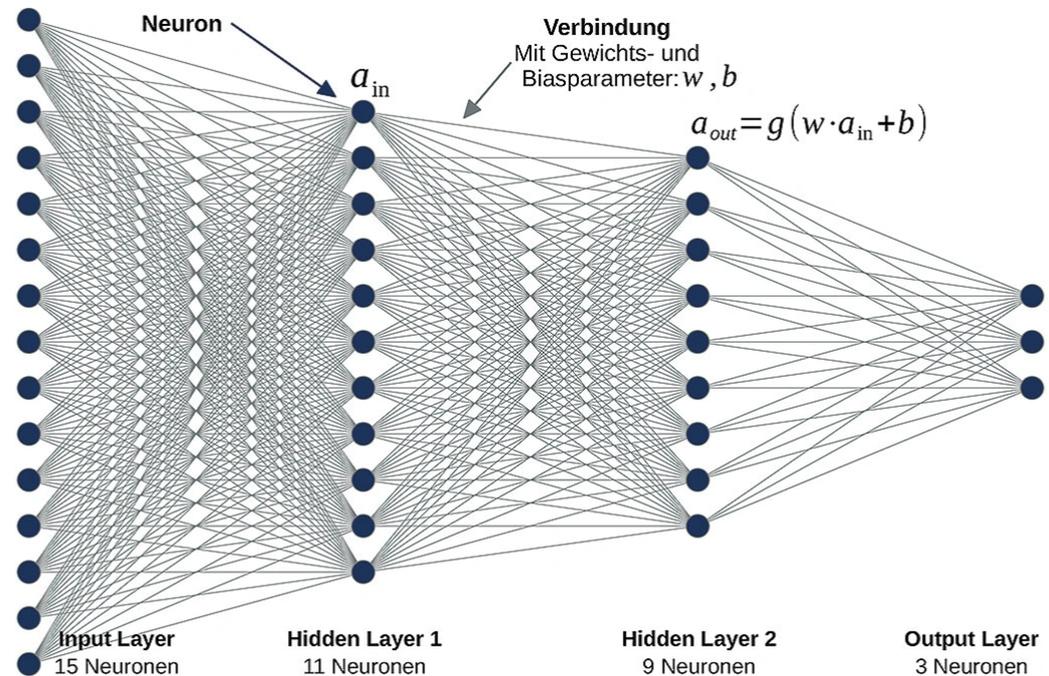
mit kleinstem Fehler



# Was ist Künstliche Intelligenz?



Finde Tal in Hügellandschaft  
mit Millionen Dimensionen



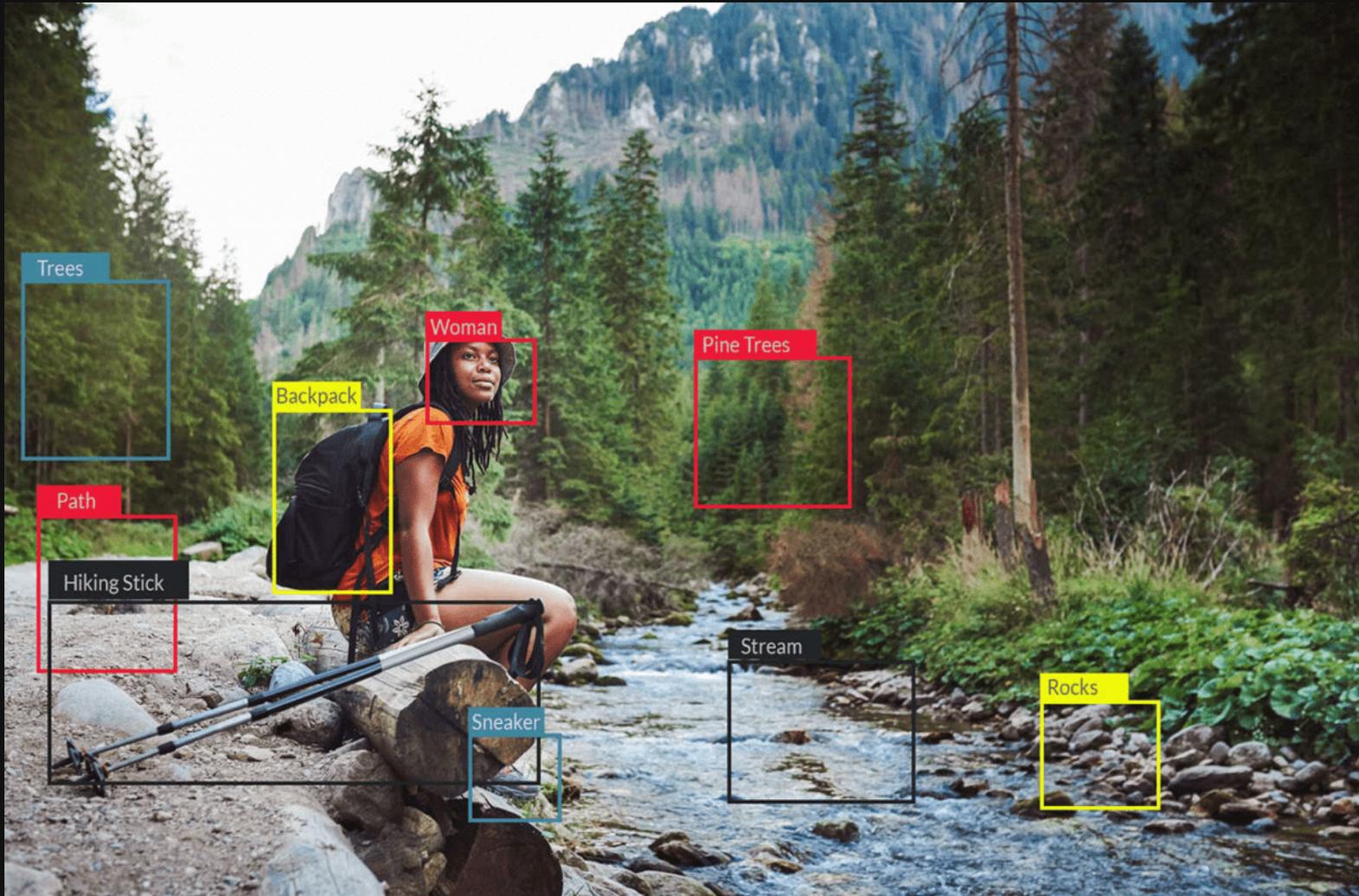
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verlorene Wanderergruppe  
ohne Sicht, Kompass, Karte  
Ziel: das richtige Tal



# Was kann KI?

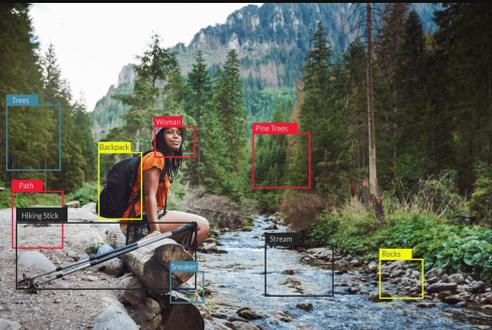
## Bilder erkennen



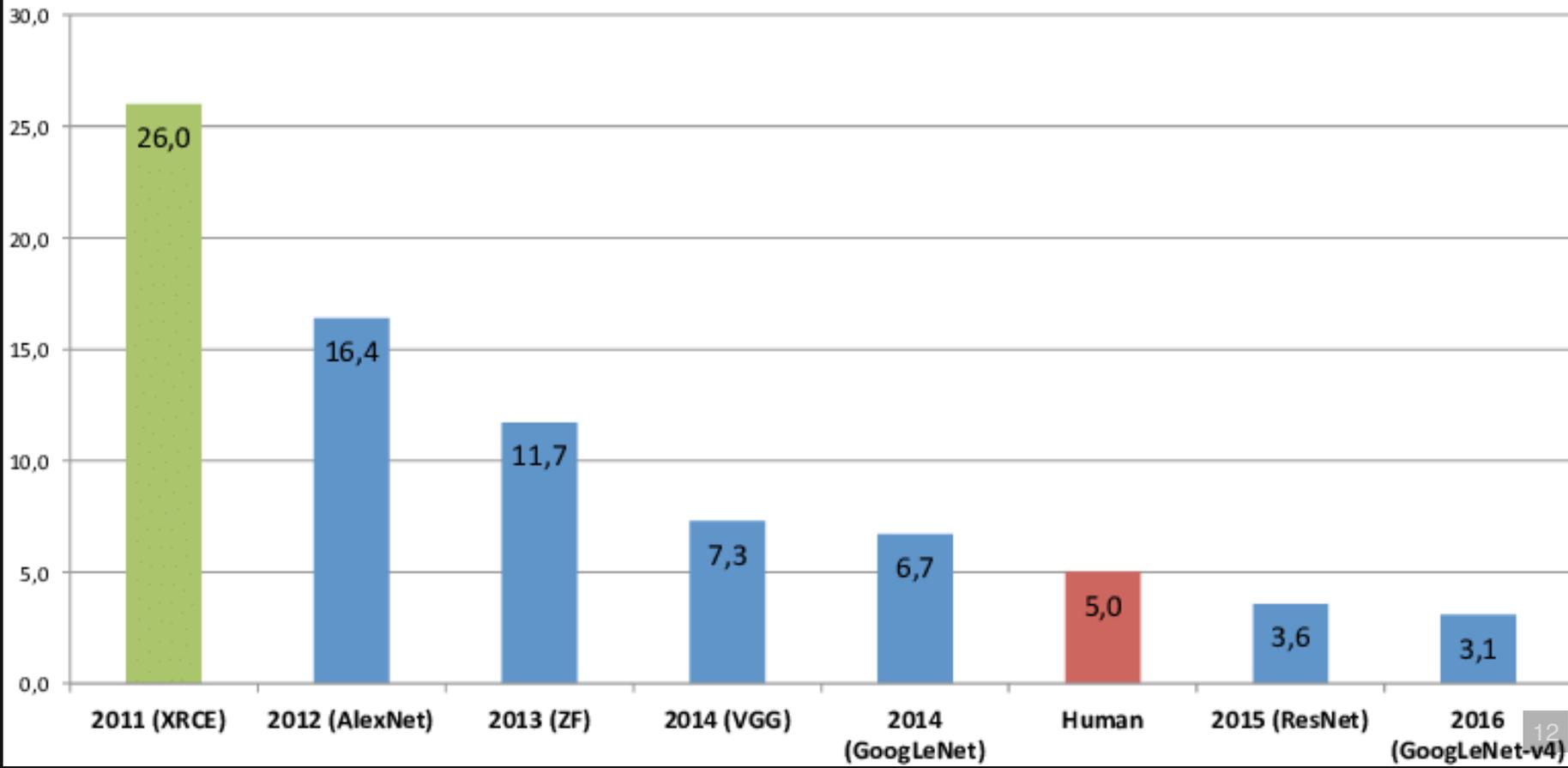
# Was kann KI?

Bilder erkennen

Seit 2015 Besser als der Mensch!



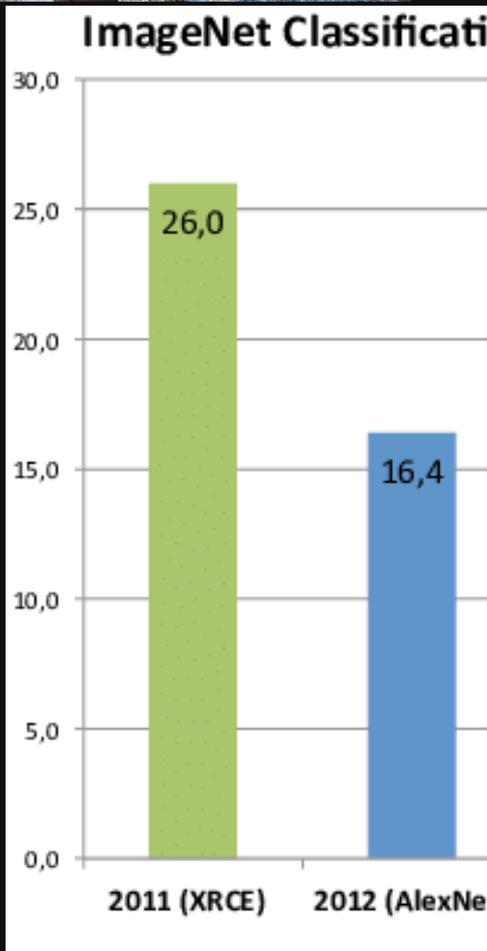
ImageNet Classification Error (Top 5)



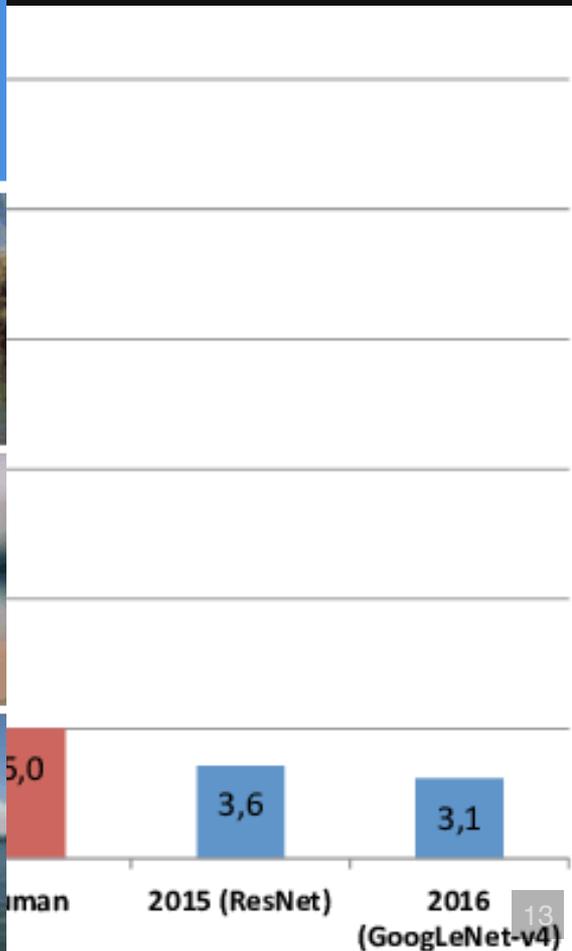
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Bilder erkennen

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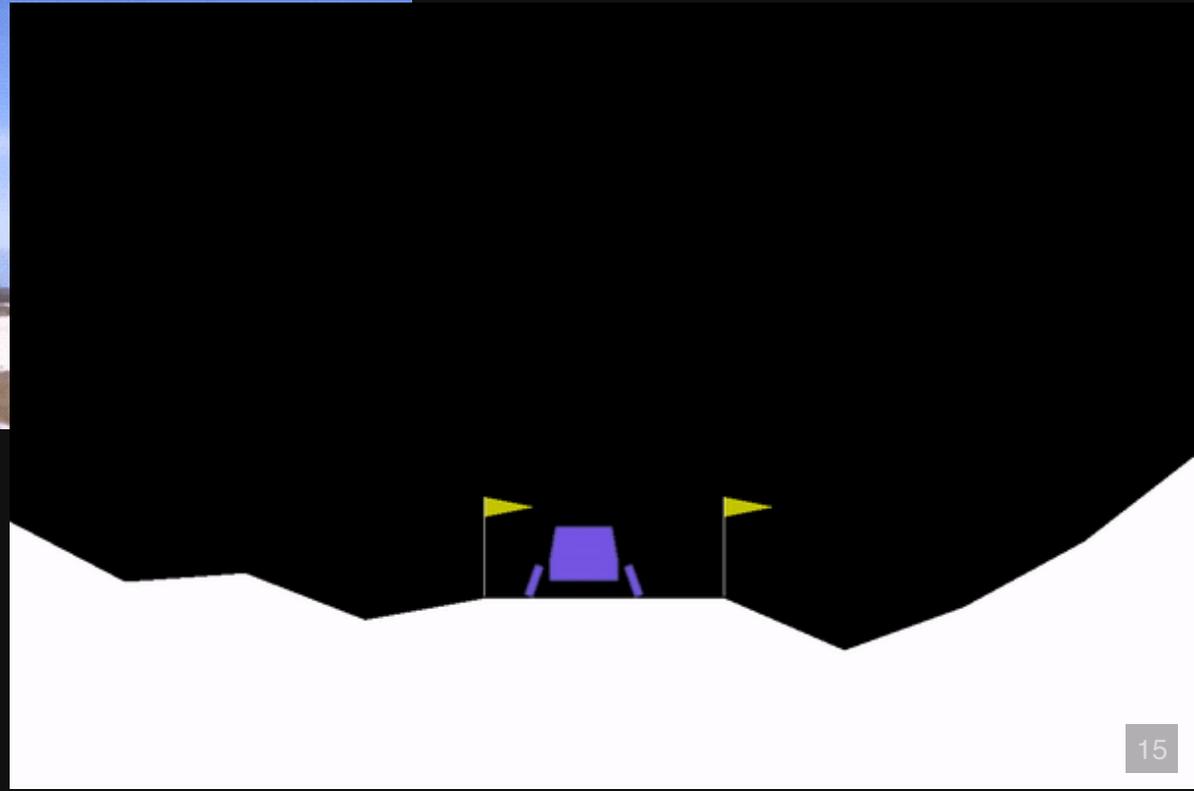
Select all images with street numbers.  
Click verify once there are none left.



# Was kann KI?



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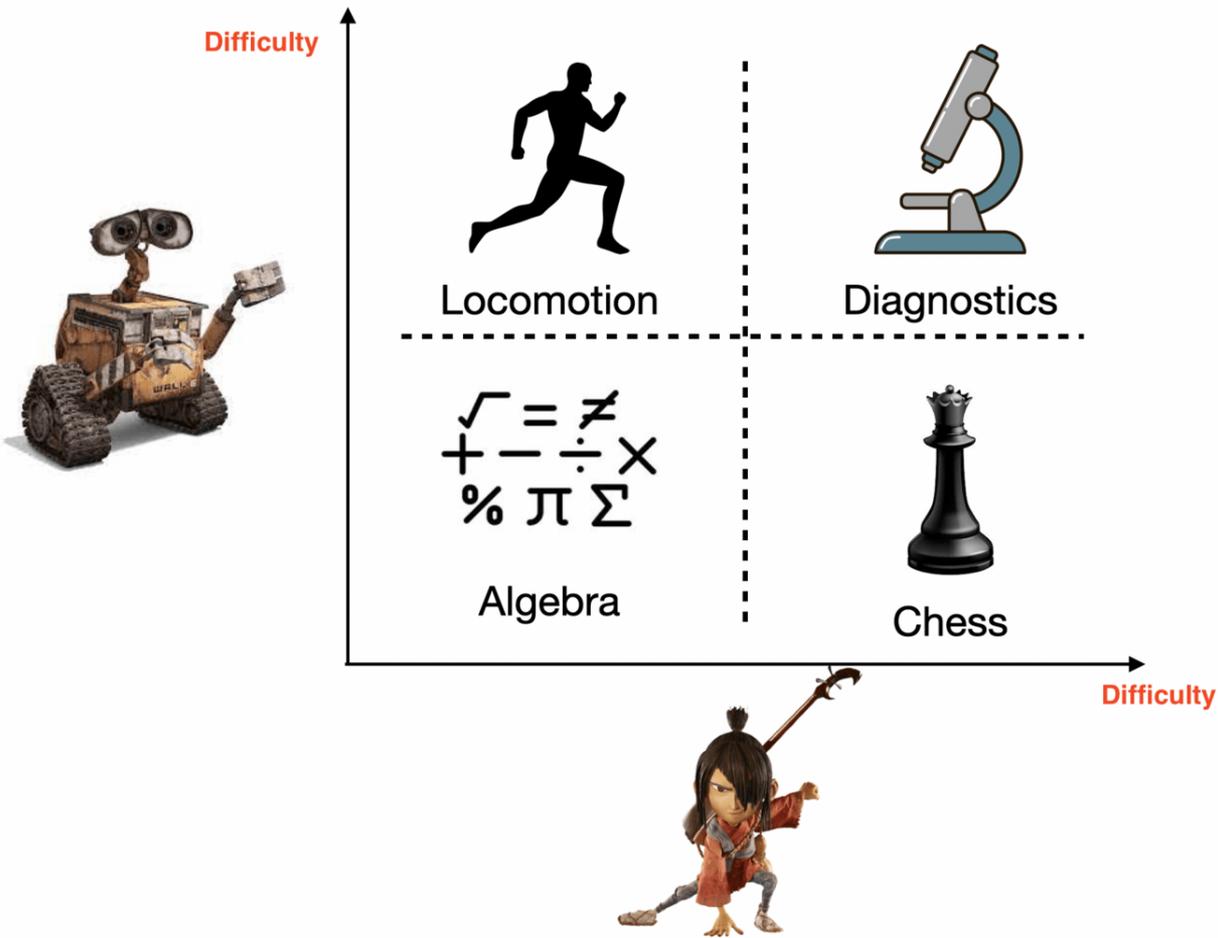


# Was kann KI?

- klar definierte, repetitive Aufgaben lösen
- optimieren
- Muster erkennen
- Zusammenfassen

# Was kann KI?

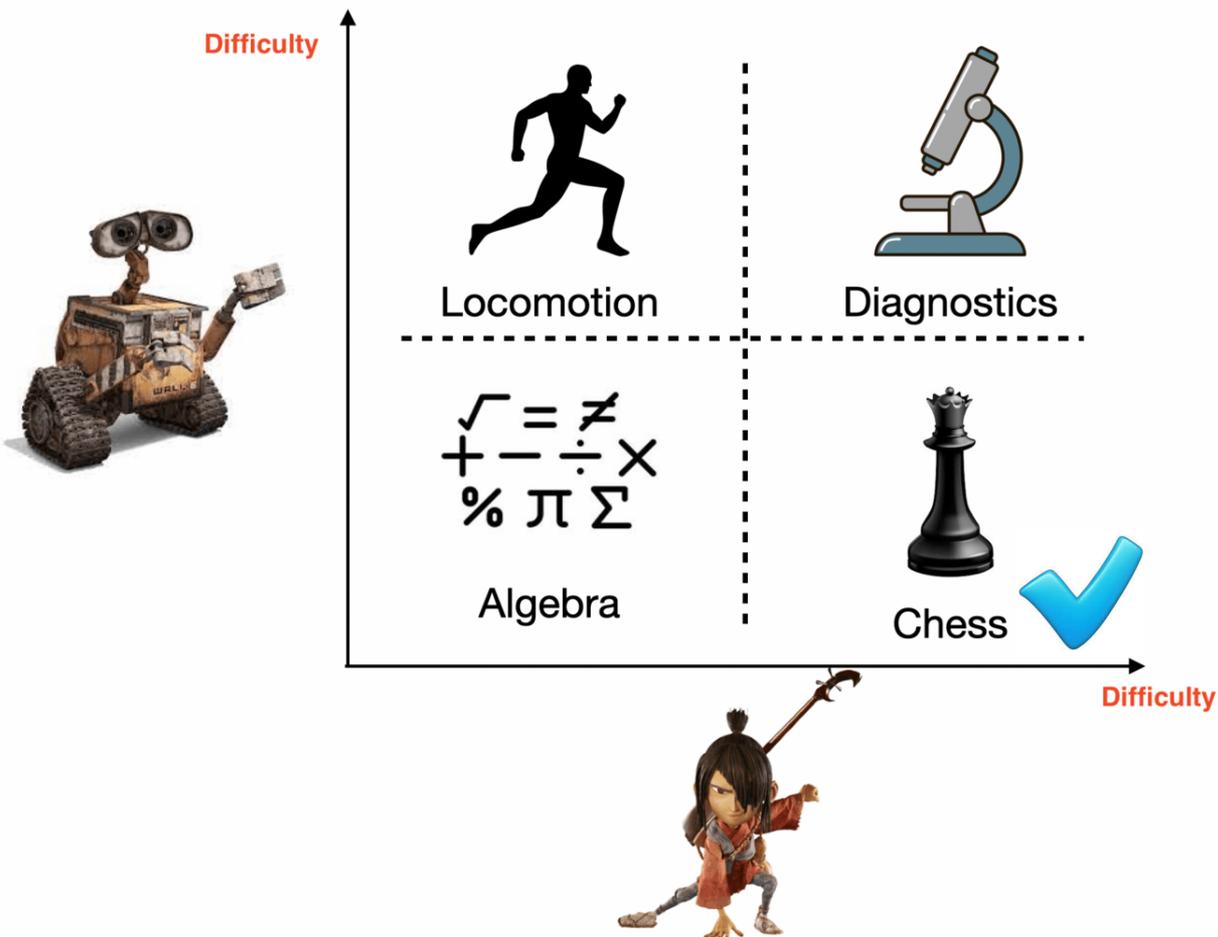
“... it is comparatively easy to make computers exhibit adult level performance on intelligence tests or playing checkers ...”



“...and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility”

# Was kann KI?

“... it is comparatively easy to make computers exhibit adult level performance on intelligence tests or playing checkers ...”



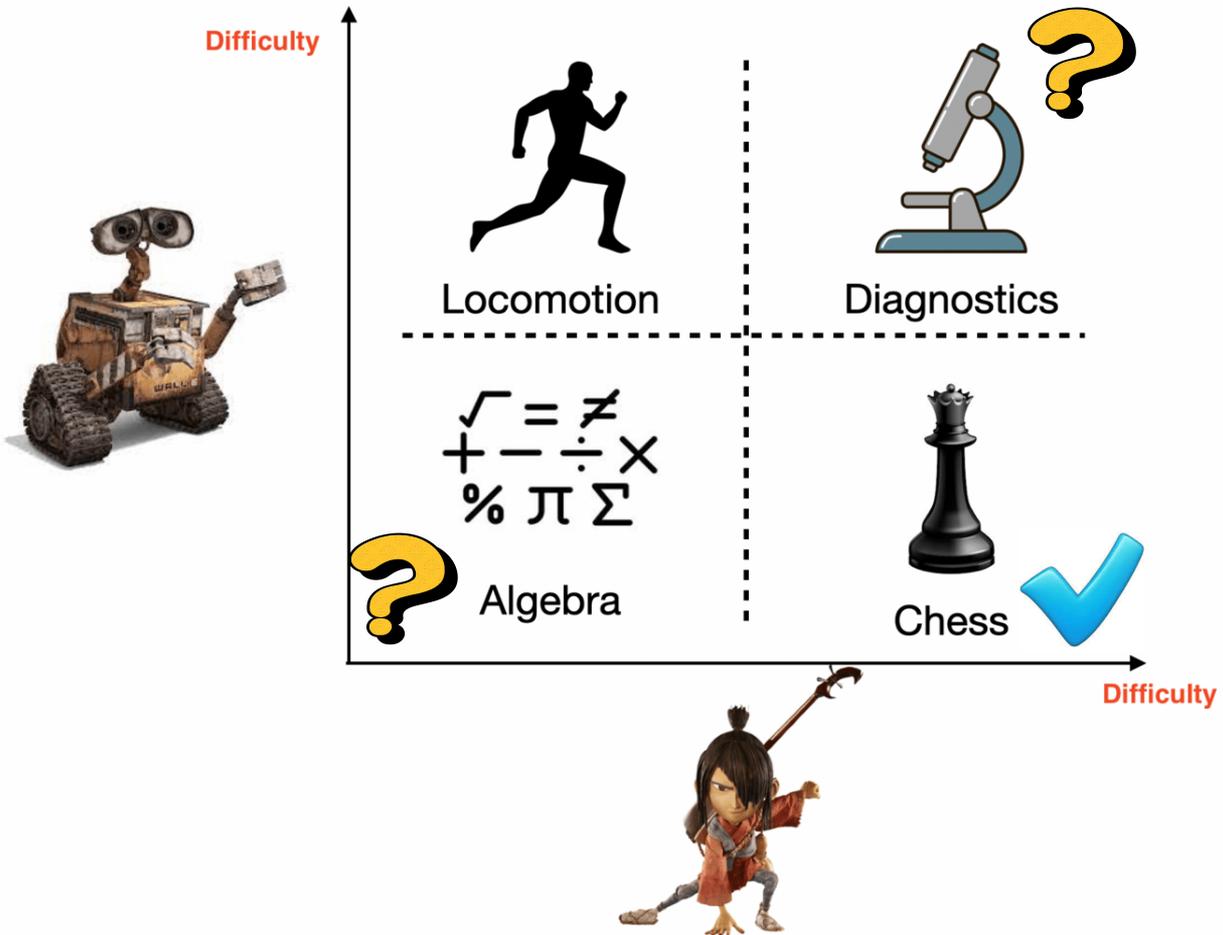
“...and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility”

- Hans Moravec, 1988

[gauthamvasan.github.io/](https://github.com/gauthamvasan)

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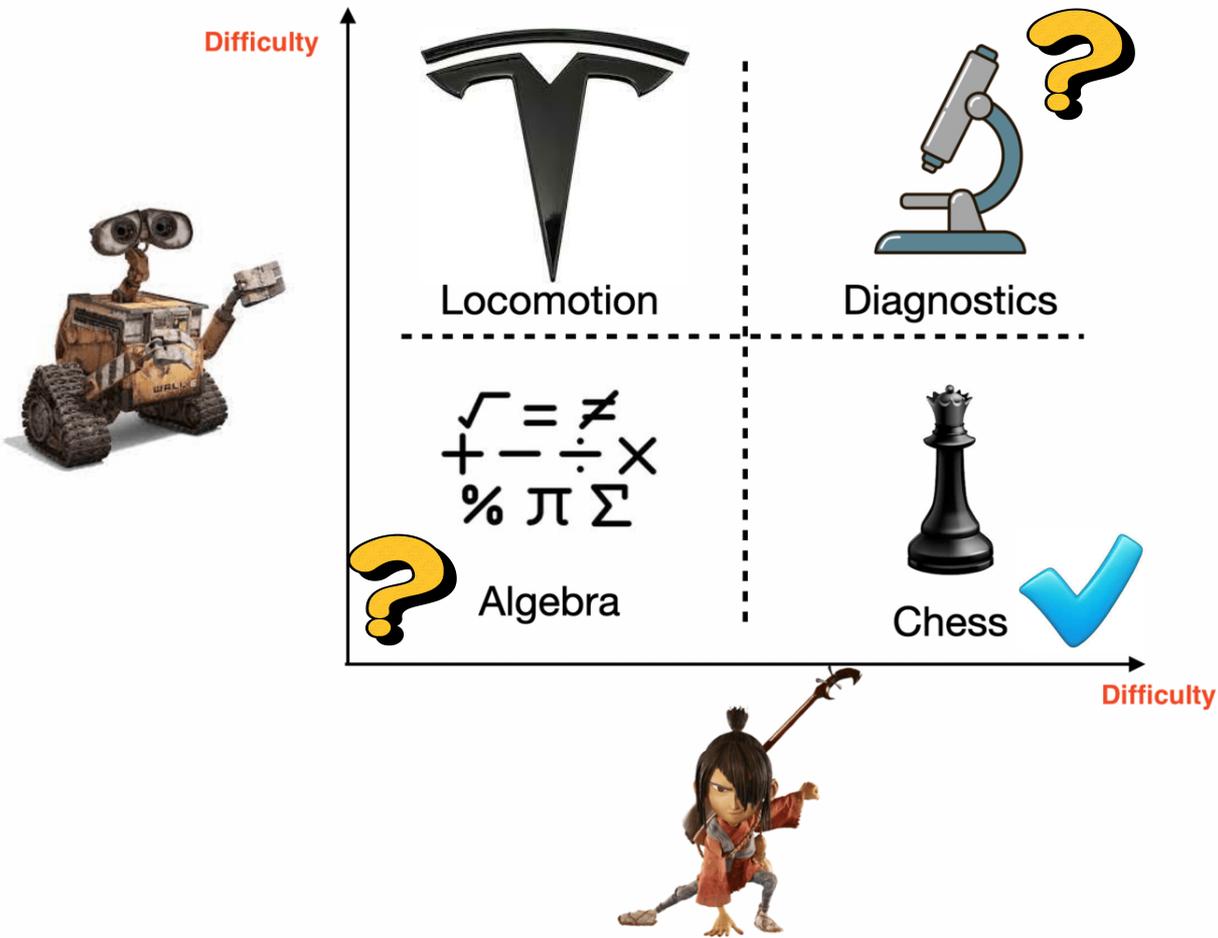
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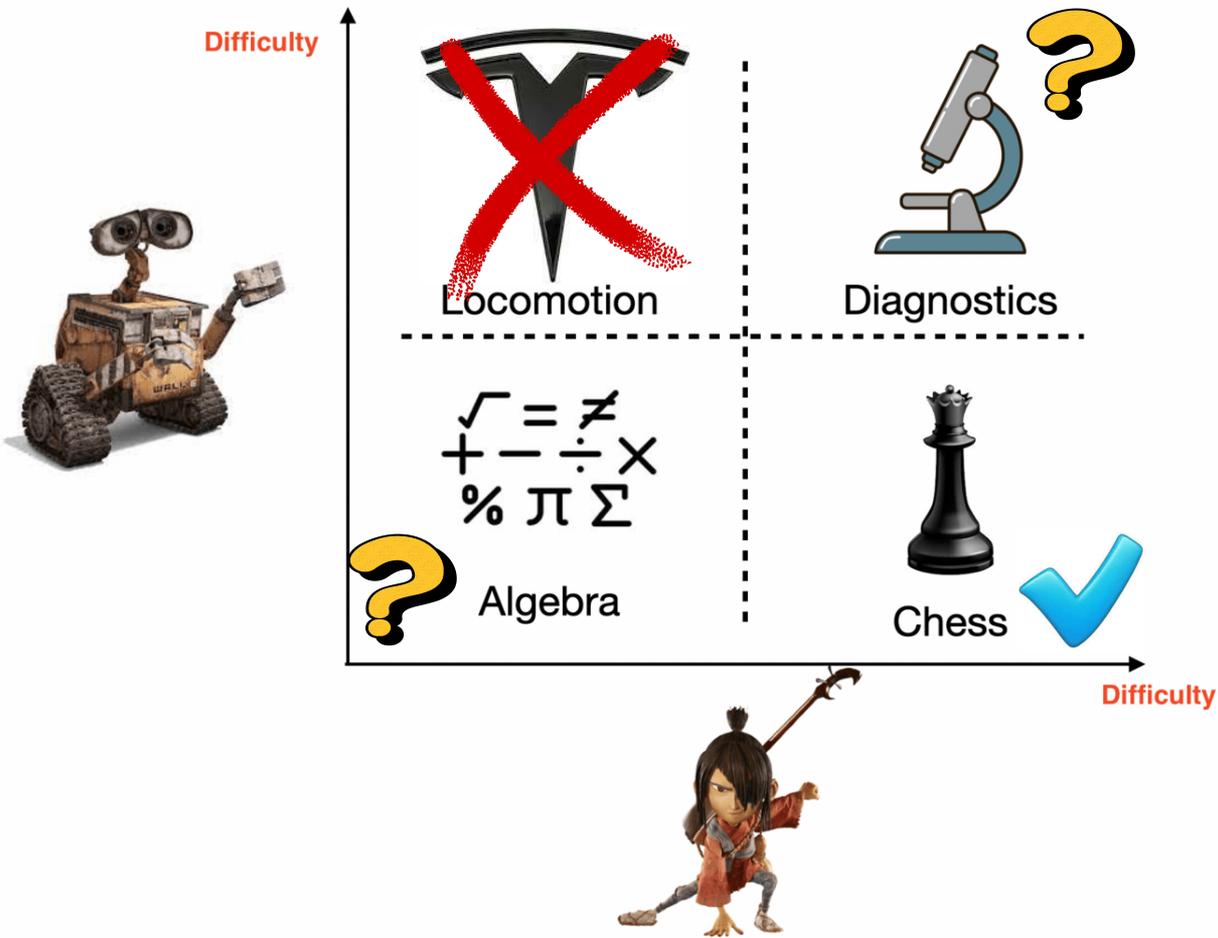
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# Was ist Künstliche Intelligenz?

- **Beschränkter Assistent**
- **Stärke:** Daten Schnell Auswerten
- **Schwäche:** Auf eine einzige Aufgabe spezialisiert
- **Hilfreich:** klar definierte, repetitive Aufgaben
- **Schädlich:** Entscheidungsprozesse auslagern
- **Guter Umgang:** einfache, aufwendige Aufgaben delegieren, wenn Qualität leicht zu prüfen ist
- **selbst Denken**