

# Artificial Intelligence

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# Overview



Intelligence

Artificial Intelligence

Types of A.I.

Components of A.I.

Applications of A.I.



# Intelligence

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# Intelligence

**“The ability to acquire  
and apply knowledge.”**

**“The ability to learn  
or understand.”**

**“Goal-directed  
adaptive behavior.”**

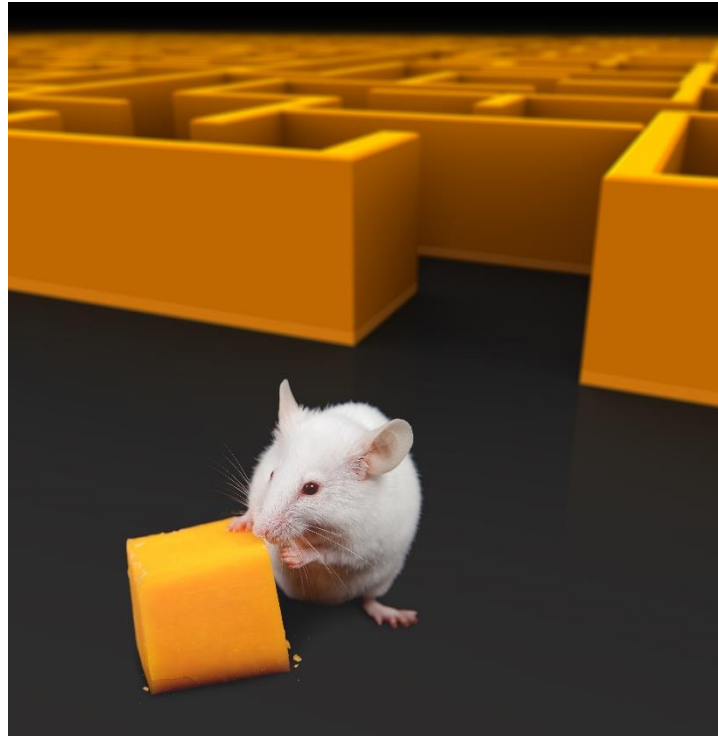
**“The ability to deal with  
cognitive complexity.”**



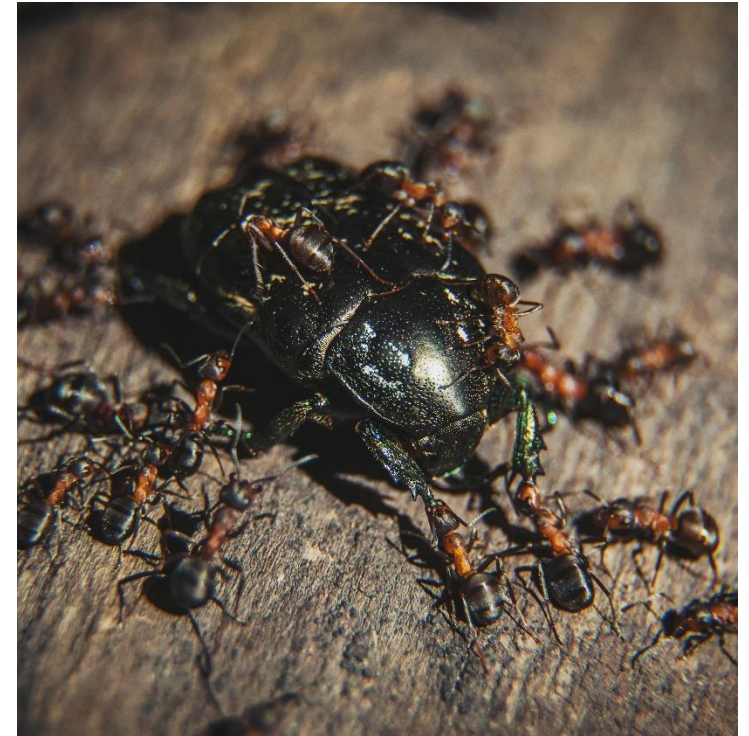
# Examples of Intelligence



**Human intelligence**



**Animal intelligence**



**Collective intelligence**



# Examples of Intelligence

**Agent**



**Human**






**Mouse**



**Ants**



# Examples of Intelligence

	Agent	Environment
	Human	Exam
	Mouse	Maze
	Ants	Colony



# Examples of Intelligence

	Agent	Environment	Goal
	Human	Exam	Pass
	Mouse	Maze	Cheese
	Ants	Colony	Protect





# Examples of Intelligence

	Agent	Environment	Goal	Perception
	Human	Exam	Pass	Read
	Mouse	Maze	Cheese	See
	Ants	Colony	Protect	Smell



# Examples of Intelligence

	Agent	Environment	Goal	Perception	Action
	Human	Exam	Pass	Read	Solve
	Mouse	Maze	Cheese	See	Navigate
	Ants	Colony	Protect	Smell	Attack



# Examples of Intelligence

	Agent	Environment	Goal	Perception	Action
	Human	Exam	Pass	Read	Solve
	Mouse	Maze	Cheese	See	Navigate
	Ants	Colony	Protect	Smell	Attack



# Intelligence

The ability of an agent  
to perceive an environment  
and to choose actions  
that increase its chances  
of achieving a goal



# Intelligence

The ability of an agent to perceive an environment and to choose actions that increase its chances of achieving a goal by learning, knowledge, reasoning, planning, etc.



# Artificial Intelligence

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# Types of Intelligence



**Natural intelligence**



**Artificial intelligence**



# Types of Intelligence



**Natural intelligence**



**Artificial intelligence**



# Types of Intelligence



Natural intelligence



Artificial intelligence

# Artificial Intelligence

The ability of a machine  
to replicate natural intelligence



# Artificial Intelligence

The ability of a machine  
to perceive an environment  
and to choose actions  
that maximize  
the expected likelihood  
of achieving a goal



# Artificial Intelligence

The ability of a **machine**  
to perceive an environment  
and to choose actions  
that maximize  
the expected likelihood  
of achieving a goal



# Artificial Intelligence

The ability of a machine  
to perceive an **environment**  
and to choose actions  
that maximize  
the expected likelihood  
of achieving a goal



# Artificial Intelligence

The ability of a machine  
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# Artificial Intelligence

The ability of a machine  
to perceive an environment  
and to choose actions  
that maximize  
the expected likelihood  
of achieving a goal



# Artificial Intelligence

Anything a human can do  
but a machine cannot yet do



# Types of A.I.

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# Types of A.I.

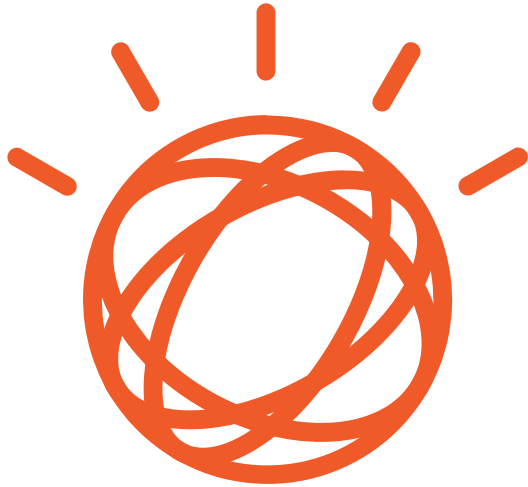
**Artificial  
narrow  
intelligence**

**Artificial  
general  
intelligence**

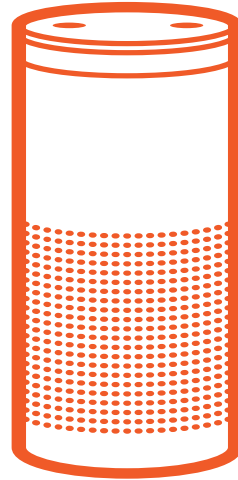
**Artificial  
super  
intelligence**



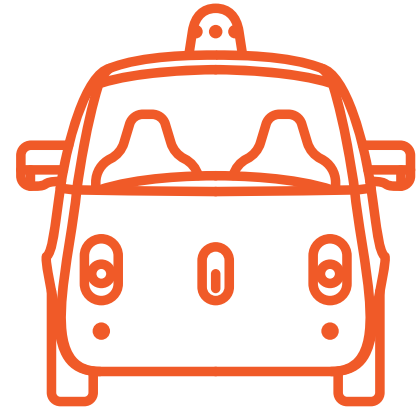
# Artificial Narrow Intelligence



IBM  
Watson

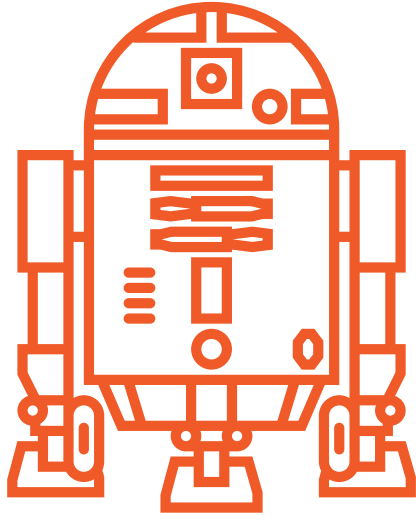


Amazon  
Alexa

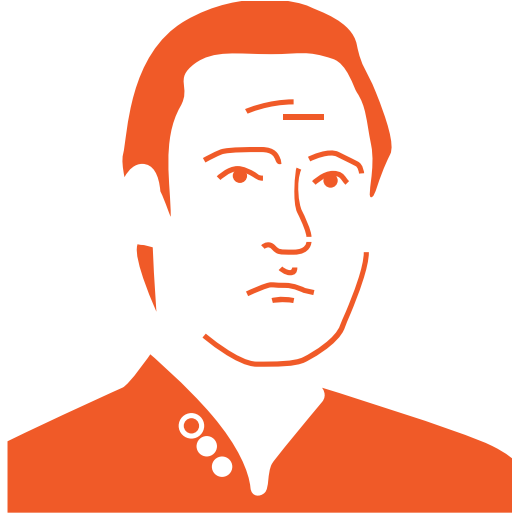


Google  
Waymo

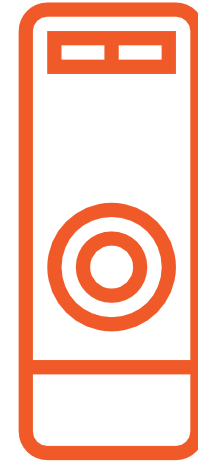
# Artificial General Intelligence



R2D2



Data



HAL 9000



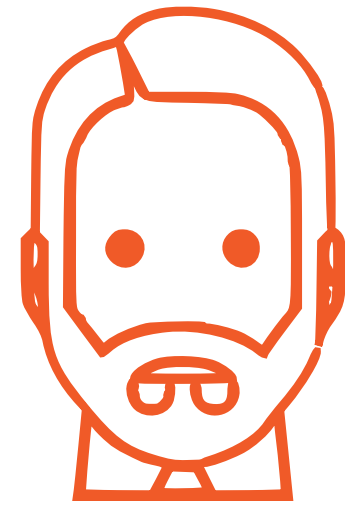
# Artificial Super Intelligence



Skynet



Ultron



The Architect

# Types of A.I.

**Artificial  
narrow  
intelligence**

**Artificial  
general  
intelligence**

**Artificial  
super  
intelligence**





# Components of A.I.

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# Components of Artificial Intelligence



Perception



Learning



Knowledge



Reasoning



Planning

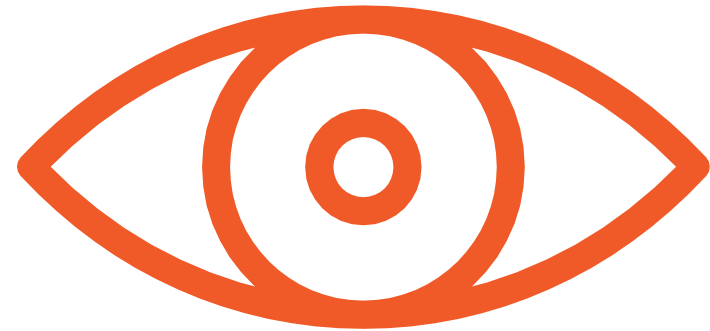


# Perception

Deduce state from sensors

Recognize patterns

Detect features



# Learning

Extract knowledge

Data in, action out

Maps state to action



# Knowledge

Represent learning

Collection of information

Various representations

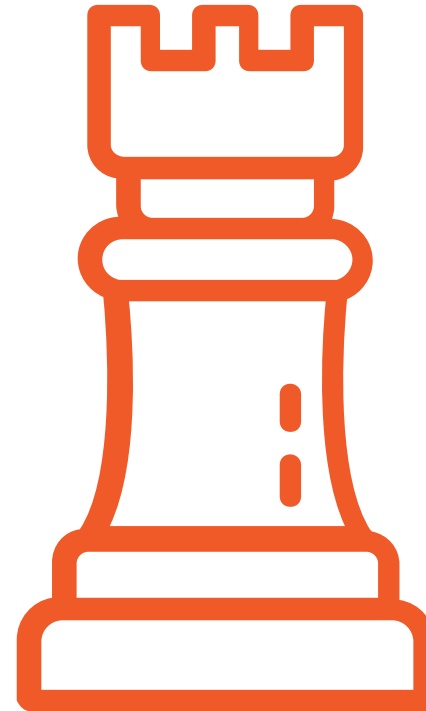


# Reasoning

Infer conclusions

Deduction

Induction

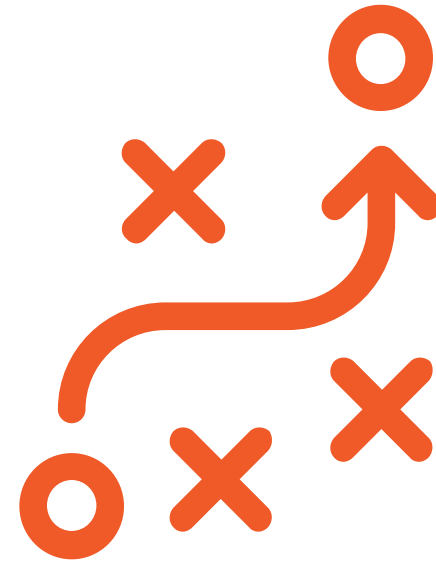


# Planning

Set and achieve goals

Visualize future states

Predict actions



# Components of Artificial Intelligence



Perception



Learning



Knowledge



Reasoning



Planning





# Applications of A.I.

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# Examples of A.I.



# Customer Service

**FAQ  
generators**

**Chat  
bots**

**Voice  
assistants**



# Finance

**Trading  
algorithms**

**Fraud  
detection**

**Portfolio  
management**



# Healthcare

**Diagnostic  
tools**

**Treatment  
recommendation**

**Prescription  
verification**



# Manufacturing

**Product  
design**

**Industrial  
robots**

**Defect  
detection**



# Marketing

**Advertisement  
optimization**

**Sentiment  
analysis**

**Product  
recommendation**



# Transportation

**Warehouse  
robots**

**Route  
optimization**

**Delivery  
drones**







This is just the tip of the iceberg!

# Summary

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# Summary



Intelligence

Artificial Intelligence

Types of A.I.

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