

CS-C1000 – Introduction to Artificial Intelligence

Recap: What was AI now again?

Arno Solin

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 @arnosolin

 arno.solin.fi

Lectures



What is AI?



Machine learning



Deep learning



Reinforcement learning



Search, logic, and symbolic AI



Impact and ethics of AI

Guest lectures this year



Janne Pulkkinen

Head of IT innovation
KELA



Markus Ojala

Staff Data Scientist
Unity Technologies

Exercise sessions



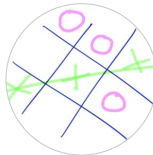
Reading
comprehension



Computer
assignment A



Computer
assignment B

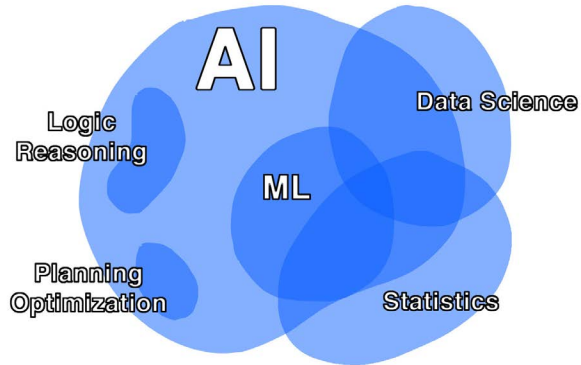


Computer
assignment C



Course
Essay

Artificial intelligence



What was AI now again?

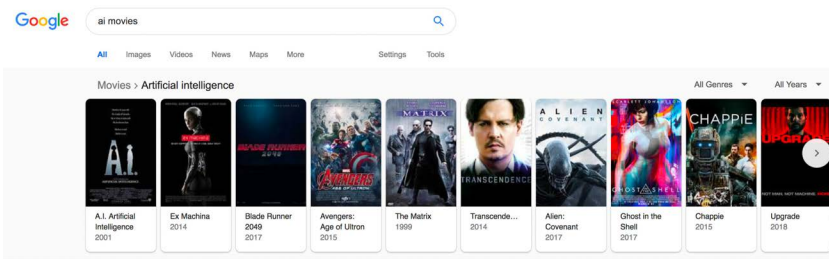
- ▶ On this course in very broad terms:
“A system that can show adaptation.”
- ▶ *“A decision-making tool or aid.”*
- ▶ *“AI makes computers do things, that, if people did them, we would consider intelligent.”*
- ▶ *AI can explain how human intelligence works, and reproduce it in computers.*

What was AI now again?

“Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions—with some degree of autonomy—to achieve specific goals. AI-based systems can be purely software-based, acting in the virtual world (voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (advanced robots, autonomous cars, drones or Internet of Things applications).”

(The EU, April 25, 2018)

The weight of science fiction



List of artificial intelligence films - Wikipedia

https://en.wikipedia.org/wiki/List_of_artificial_intelligence_films

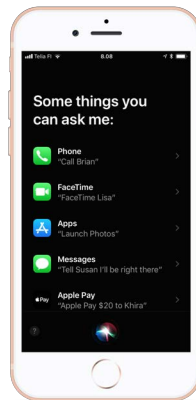
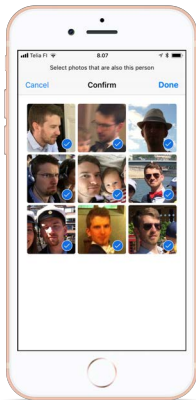
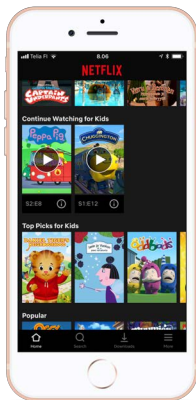
This article contains a chronological list of films which included artificial intelligence either as a designated or as an essential part of the film.

*Can we come up with anything new in AI
that Sci-Fi would not have already invented?*

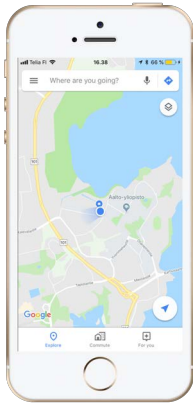
~~Is this AI?~~

What kind of AI is this?

What kind of AI is this?



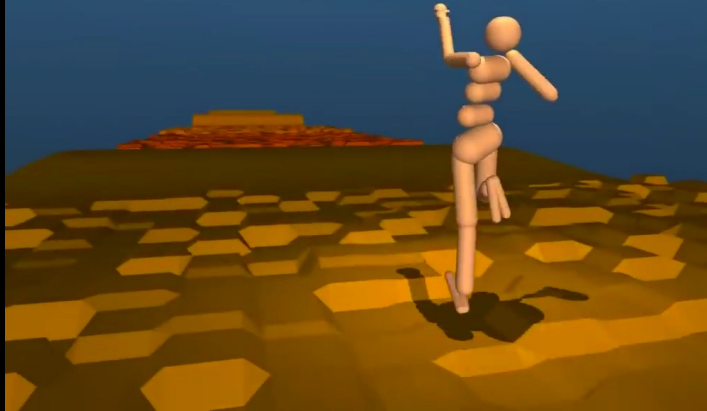
What kind of AI is this?



What kind of AI is this?



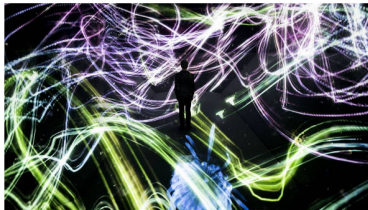
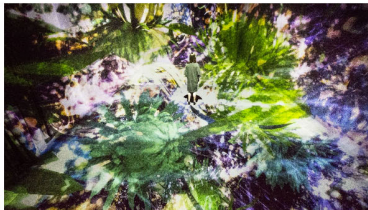
Humanoid:
27 DoFs, 21 Actuators.



Emergence of Locomotion Behaviours in Rich Environments:
https://www.youtube.com/watch?v=hx_bgoTF7bs

What kind of AI is this?

teamLab★



Crows are Chased and the Chasing Crows are Destined to be Chased
as well, Transcending Space

teamLab, 2017, Interactive Digital Installation, 4min 20sec, Sound: Hideaki Takahashi

*“The installation is rendered in real time by a computer program,
it is neither a prerecorded animation nor on loop. The installation
as a whole is in constant change, previous states will never be
repeated and can never be seen again.”*

What kind of AI is this?



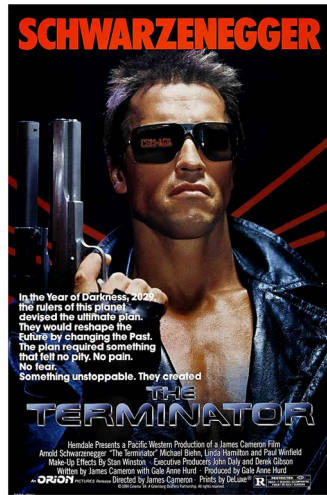
<https://www.thispersondoesnotexist.com/>

What kind of AI is this?

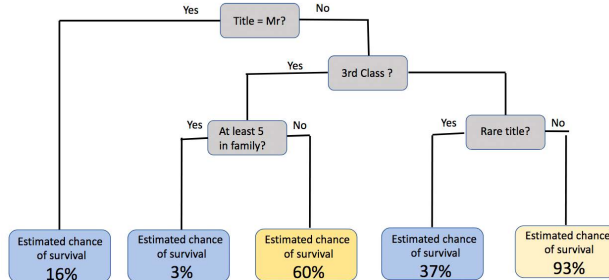


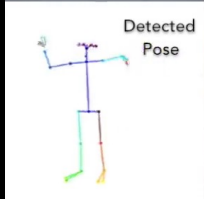
Google Vision Kit: “Do-it-yourself intelligent camera. Experiment with image recognition using neural networks.”

What kind of AI is this?



What kind of AI is this?





Everybody Dance Now
<https://youtu.be/PCBTZh41Ris>

But wait, there is more!

I want to learn more about methods!

- ▶ **CS-EJ3211 – Machine Learning with Python**
Get started with basics of machine learning.
- ▶ **CS-E4800 – Artificial Intelligence**
Artificial intelligence, with slight focus on symbolic AI.
- ▶ **CS-C3160 – Data Science**
Introduction to data science and related topics.
- ▶ **[many more courses]**
Many courses with a focus on specific topics/methods:
Statistical ML, Deep learning, RL, etc.

I want to learn more about applications!

- ▶ **ELEC-E7260 – ML for Mobile and Pervasive systems**
An overview of ML for mobile and pervasive systems.
- ▶ **DOM-E5129 – Intelligent Computational Media**
Understand what the tools can be used for in context of art, media, and design. Hands-on work.
<https://github.com/PerttuHamalainen/MediaAI>
- ▶ **UWAS-C0025 – Art and Artificial Intelligence**
Artificial intelligence applied to art. Hands-on work.
- ▶ **[many more courses]**
Many special courses with a focus on a specific field:
Materials science, business, chemistry, etc.

Finnish center for artificial intelligence



FCAI is a nation-wide competence center for Artificial Intelligence in Finland, initiated by Aalto University, University of Helsinki, and VTT Technical Research Centre of Finland.

What next?

- ▶ One remaining quiz (this lecture).
- ▶ Course essay and peer-grading.
- ▶ Course feedback
(earn some additional points and improve this course).

Thank you for the course!

AI