



This is a draft/review version.

It will be replaced with the final version by end of day on the day prior to the associated session.

This slide will be removed from the final version.

Artificial Intelligence

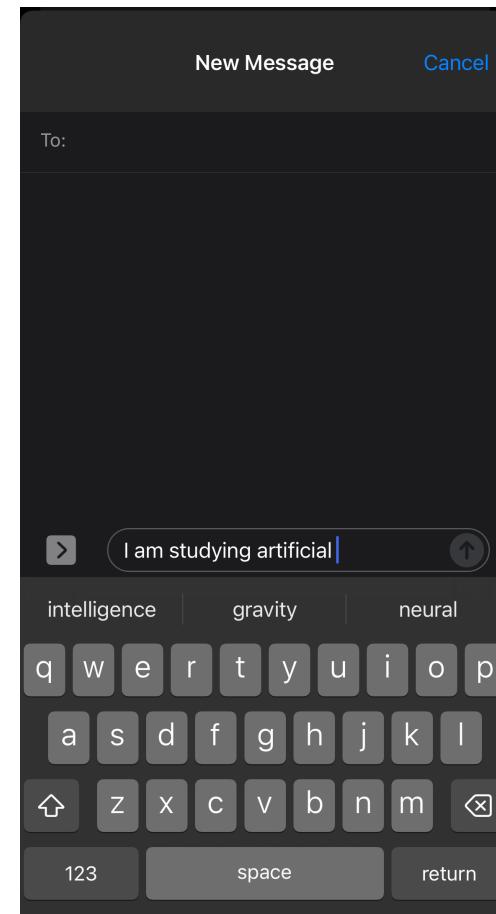
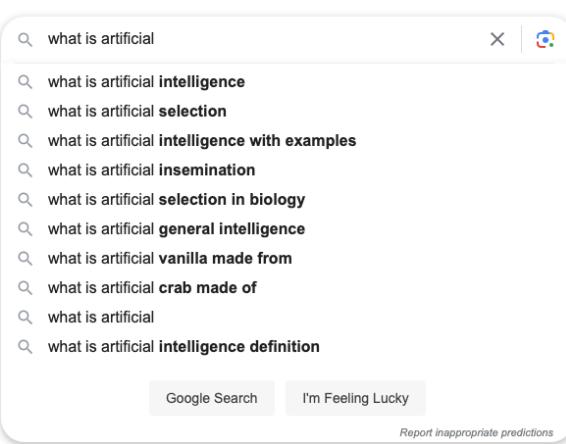
Tour of the World Wide Web – Session 6

Duke OLLI Fall 2023

David Shamlin

Current Events

Example: Autocompletion



Example: Voice Recognition

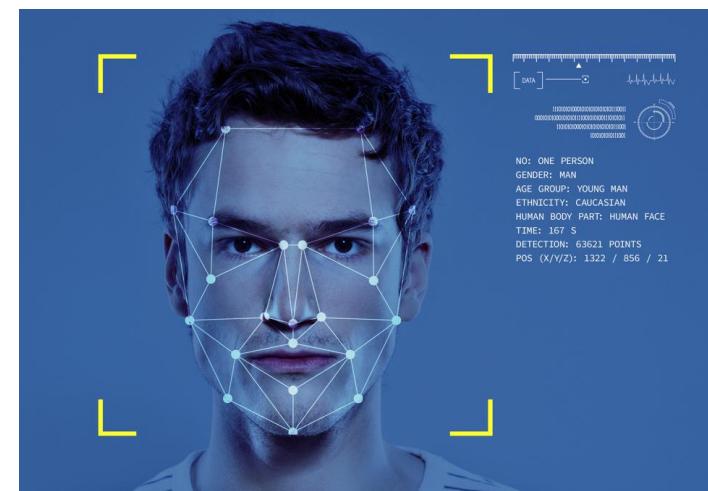
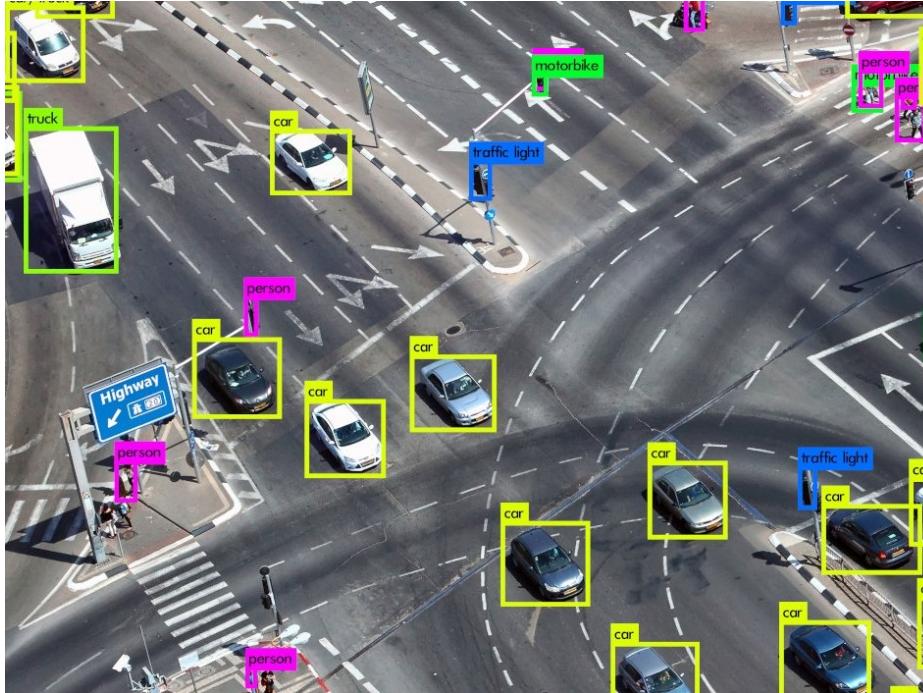


Bixby

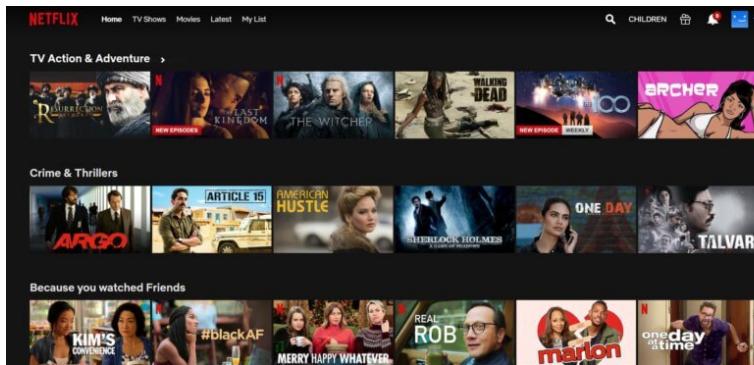


Siri

Example: Image Recognition

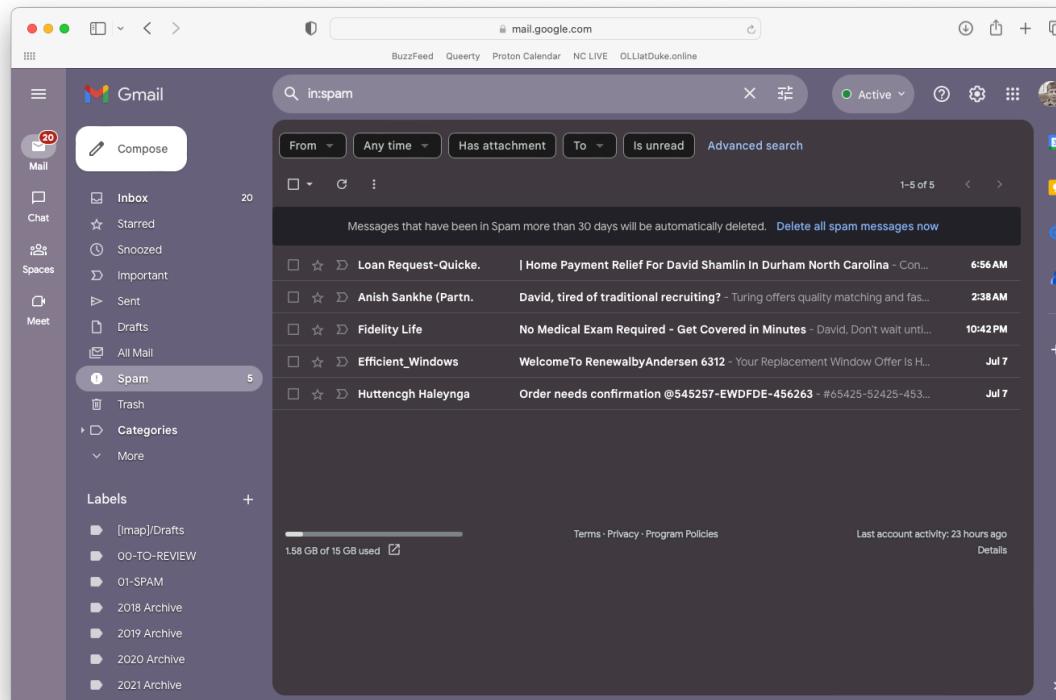


Example: Recommendation Engines



A screenshot of the Amazon website. At the top, there's a search bar with the placeholder 'Search Amazon' and a dropdown menu showing 'All'. Below the search bar, there are several navigation links: All, Clinic, Amazon Basics, Customer Service, Pharmacy, Pet Supplies, Health & Household Products, Beauty & Personal Care, and '3 days until Prime Day'. A banner at the top says 'Top picks for you'. Below the banner, there are ten product cards arranged in two rows of five. Each card includes a thumbnail image, the product title, a brief description, a star rating, and a price. For example, the first card is for 'Be Exceptional: Master the Five Traits That Set Extraordinary People Apart' by Joe Navarro, priced at \$13.99. The last card is for 'Becoming the Narcissist's Nightmare: How to Devalue and Discard the Narcissist While...' by Shulie Andra, priced at \$9.99.

Example: Email Spam Filters





Alan Turing

“Computing Machinery and Intelligence”

Mind, October 1950

1956 Dartmouth Conference: The Founding Fathers of AI



John McCarthy



Marvin Minsky



Claude Shannon



Ray Solomonoff



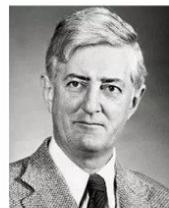
Alan Newell



Herbert Simon



Arthur Samuel



Oliver Selfridge



Nathaniel Rochester



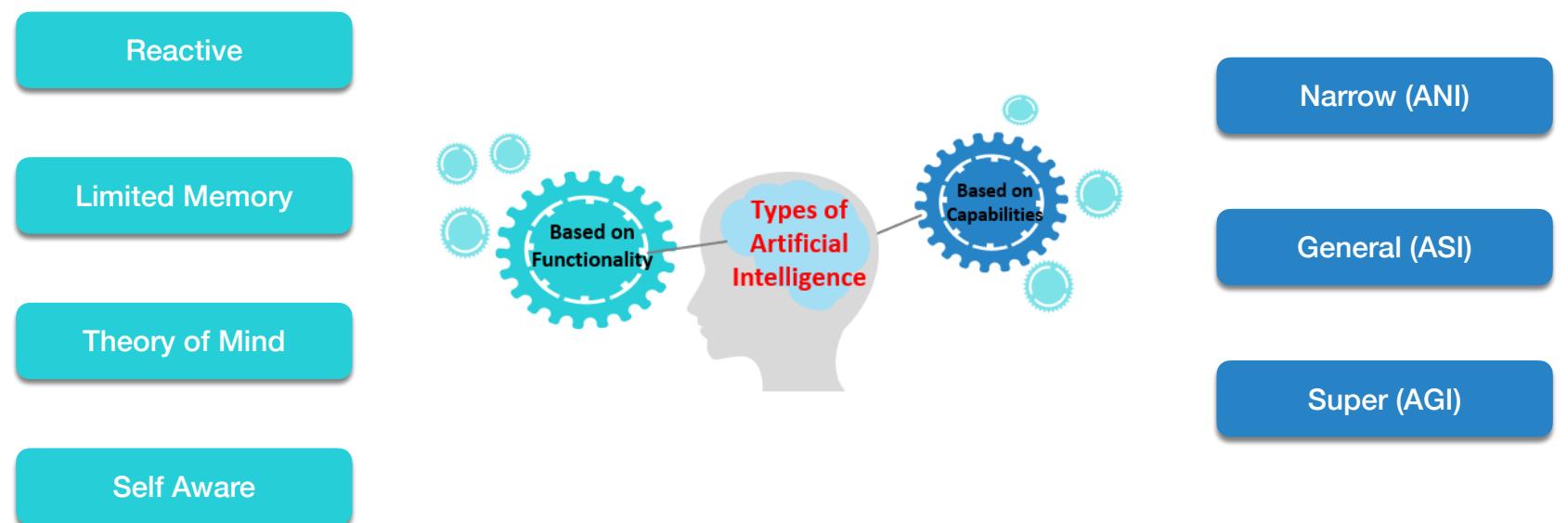
Trenchard More

Definition

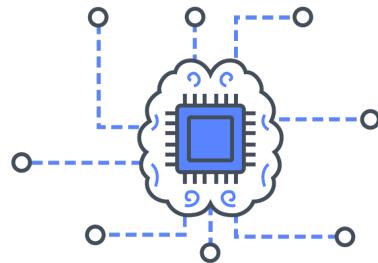
The term ‘artificial intelligence’ means a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. Artificial intelligence systems use machine and human-based inputs to – (A) perceive real and virtual environments; (B) abstract such perceptions into models through analysis in an automated manner; and (C) use model inference to formulate options for information or action.

National Artificial Intelligence Initiative Act of 2020

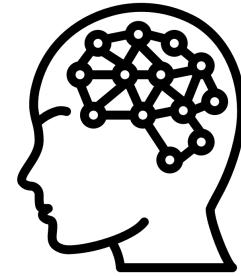
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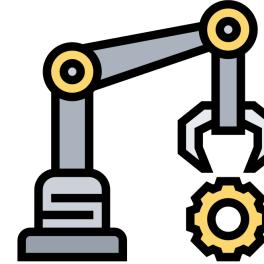
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Machine Learning



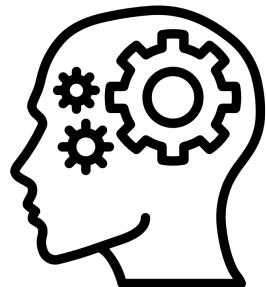
Neural Networks



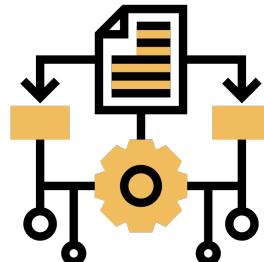
Robotics



Pattern Recognition



Expert Systems



Fuzzy Logic



Natural Language Processing

Timeline of images generated by artificial intelligence

These people don't exist. All images were generated by artificial intelligence.

Our World
in Data

2014



Goodfellow et al. (2014) – Generative Adversarial Networks

2015



Radford, Metz, and Chintala (2015) – Unsupervised Representation Learning with Deep Convolutional GANs

2016



Liu and Tuzel (2016) – Coupled GANs

2017



Karras et al. (2017) – Progressive Growing of GANs for Improved Quality, Stability, and Variation

2018



Karras, Laine, and Aila (2018) – A Style-Based Generator Architecture for Generative Adversarial Networks

2019



Karras et al. (2019) – Analyzing and Improving the Image Quality of StyleGAN

2020



Ho, Jain, & Abbeel (2020) – Denoising Diffusion Probabilistic Models

2021

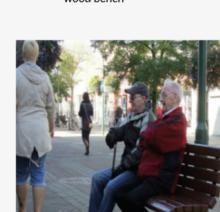


Image generated with the prompt:
"a couple of people are sitting on a wood bench"

Ramesh et al. (2021) – Zero-Shot Text-to-Image Generation (OpenAI's DALL-E)

2022

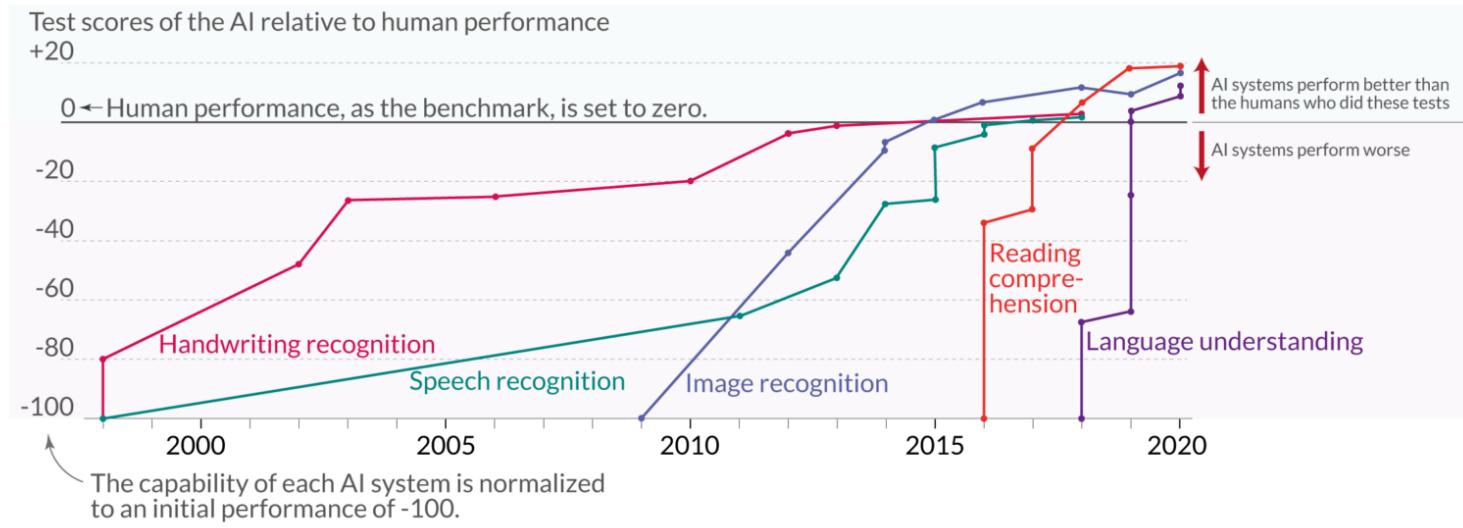


Image generated with the prompt:
"A Pomeranian is sitting on the King's throne wearing a crown. Two tiger soldiers are standing next to the throne."

Saharia et al. (2022) – Photorealistic Text-to-Image Diffusion Models with Deep Language Understanding (Google's Imagen)

Language and image recognition capabilities of AI systems have improved rapidly

Our World
in Data



Data source: Kiela et al. (2021) – Dynabench: Rethinking Benchmarking in NLP
OurWorldinData.org – Research and data to make progress against the world's largest problems.

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Pros	Cons
24 x 7 availability Increased productivity Faster decision making	Inaccuracies Biases Racism
Work with high accuracy Reduced human error	Increase in unemployment
Unbiased decision making	Ethical dilemmas
Complete routine/repetitive tasks with ease	Lack of creativity “Thinking outside the box”
Improved standard of living Can be used by anyone	
	Widening social inequality
	Social manipulation Deepfakes

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cit-371

cit-373

cit-375

cit-393

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Discussion Topics

- Can society adapt better than w social media?
- ChatGPT trained by web scraping. Is that a privacy violation?
- Generative AI: Concern about increase in mis-/dis-information — ie abuses of AI
- Is generative AI creativity?



Discussion

1. Is artificial intelligence good for society?
2. What applications would you like to see AI take over? What applications would you like to see AI stay away from?
3. Think about how AI impacts your daily life. Do you use facial recognition to unlock your phone or a digital assistant to get the weather, for example? Do these applications make your life easier or could you live without them? Explain your answers.
4. Some are concerned about GenAI resulting in a significant increase in dis-information? Assuming that is true, what should we do to protect ourselves?
Needs to be cleaned up

cit-387