AI will change the world. Who will change AI?

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Topics (Day1)

- Intro to AI
- Applications of AI
- Break – 15 mins
- Assignments
- Intro to computer vision

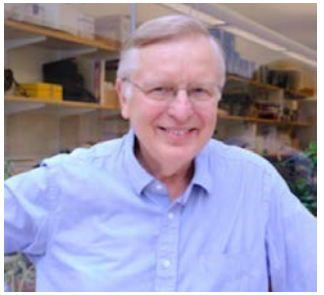
Topics (Day2)

- Intro to Machine Learning
- Intro to Recommendation system
- Intro to Python with Hands-on exercises
- Intro to SciPy with Hands-on exercises
- Using Google Colab and Keras

What is AI?

- AI is about *“Machines acting in ways that seem intelligent” – Thomas Malone of. MIT*

- *“AI is about the architectures that deploy methods enabled by constraints exposed by representations that support models of thinking, perception, and action. And of course, it’s not just about doing, it’s also about learning to do” – Patrick Winston of MIT*



History of AI

https://www.bbc.com/timelines/zq376fr

IBM Project Debater: https://www.research.ibm.com/artificial-intelligence/project-debater/

Application of AI

Siri

- **One of the most popular personal assistants and speech recognition software** available today
- Available on all Apple devices including Phone and Mac
- Connects to your information (messages, calendar, music, reminders, mail, contacts, notes, etc.) automatically, and **uses** machine learning technology **to learn and become "smarter".**

Gmail

- Google's email **platform uses machine learning to stop unwanted email or spam from entering your inbox**.
- Smart Reply**, a service that replies to emails as users do**.

Application of AI - 2

Tesla

- **Self driving** car capabilities including prediction
- Over the wire updates keep car running smooth

Netflix

- Analyzes hundreds of records so it can suggest movies, TV shows and documentaries similar to those you have seen and rated before
- It also considers day and time of the day so it can suggest personalized content to user

Application of AI - 3

Google Translate

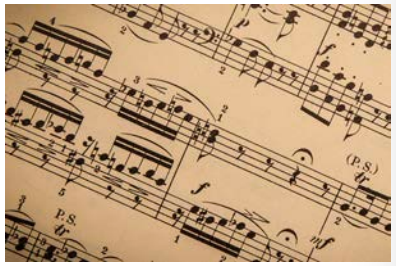
- Considered one of the best use cases of AI
- Performs a statistical analysis of language patterns found within millions of translated documents

Facebook

- AI is the reason Facebook can add attractive and relevant content to your News Feed, based on your preferences
- Analyzes your behavior and engagement making sense of your interactions (“likes”, “shares”, comments, etc.) and interests, so it can show you similar content.

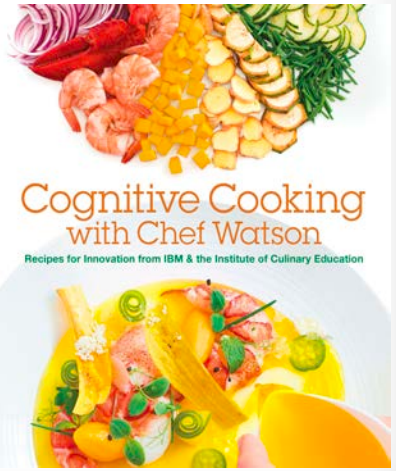
Application of AI - 4

Watson Beat



- Alex Da Kid used the cognitive system's machine learning-driven music generation algorithms
- Watson dives deeper into individual tracks to collect data on pitch, time and key signatures, and note sequences to work out what a listener might want to hear or artist may be inspired by

Chef Watson

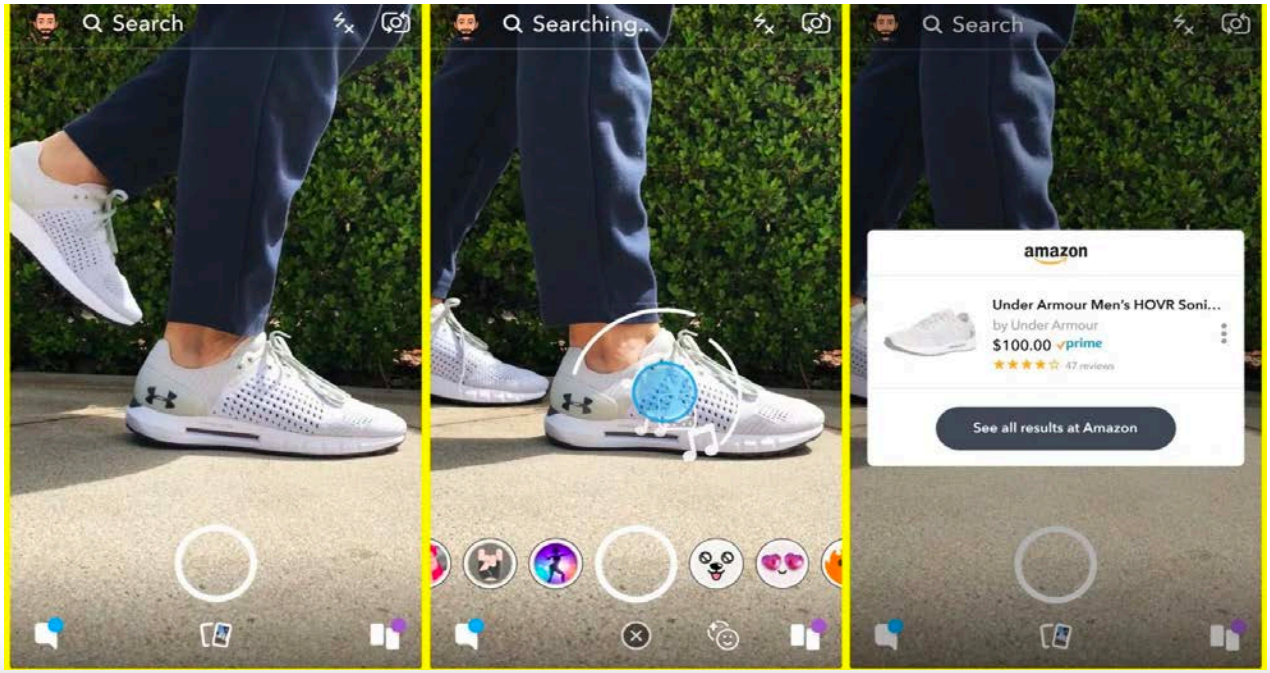


- Virtual chef helps you create a recipe based on the ingredients you already have or on something you're craving.
- Its algorithms will go through which dishes can be prepared with your ingredients and then give you several options so you can choose the dish you want, along with instructions on how to prepare it.

Application of AI - 5

When photo becomes a purchase

- Take a photo of something you like and want and Amazon Visual search on mobile will find exact or similar item available for purchase



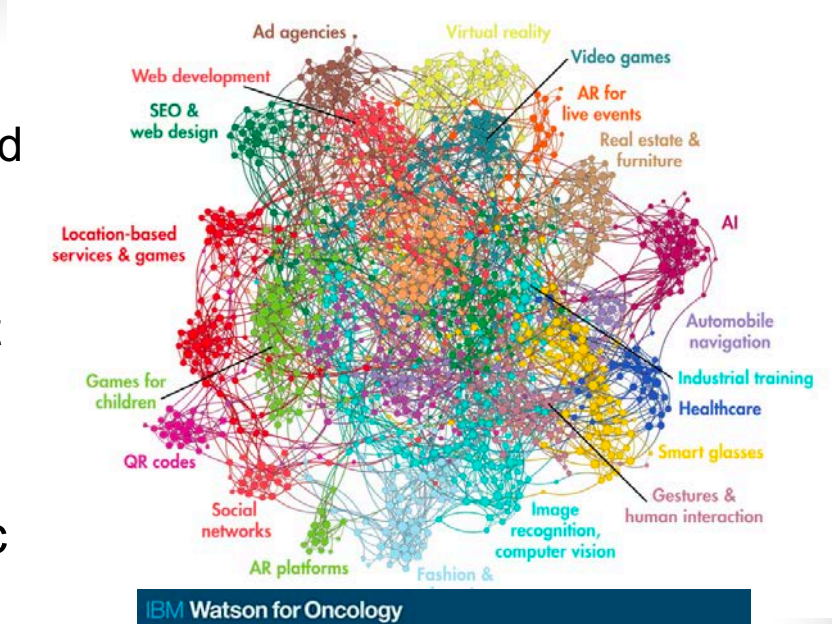
Application of AI - 6

The smart investor

- Quid developed AI based tool to analyze and predict successful startup companies of the future
- 20% of predicted companies were valued at billion dollars

Watson Oncology

- Helps providers advance patient-centric cancer care
- helps surface relevant data, bridge disparate sources of information, and identify therapeutic options that are personalized to each unique patient

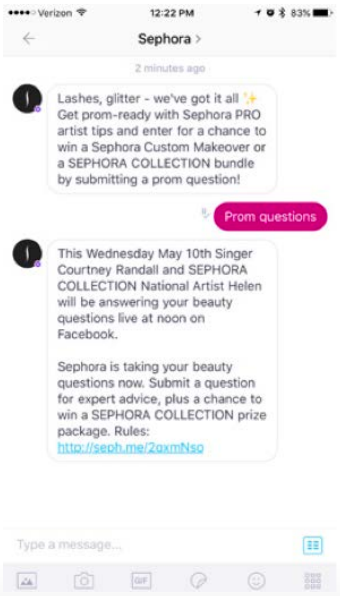


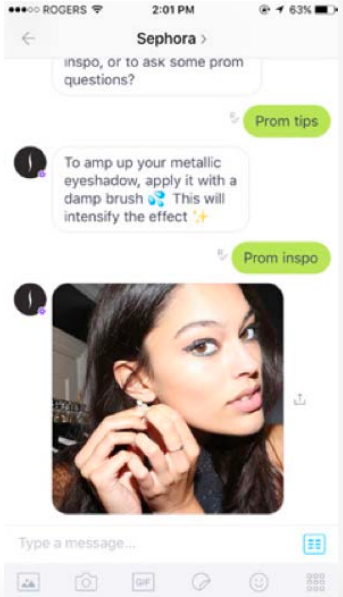
Application of AI - 7

AI in Marketing

- Pay per Click (PPC) optimization
- Digital marketing effectiveness
- Website experience – By analyzing hundreds of data points about a single user (including location, demographics, device, interaction with the website, etc.), AI can display the best-fitting offers and content
- Behavioral personalization, push notifications can be specific to individual users, delivering them the right message at the right time
- Content creation using NLG / Chatbots

albert
is an unprecedented self-learning solution that improves the effectiveness of your digital marketing with more persistence, precision, intelligence, and efficiency than any other offering

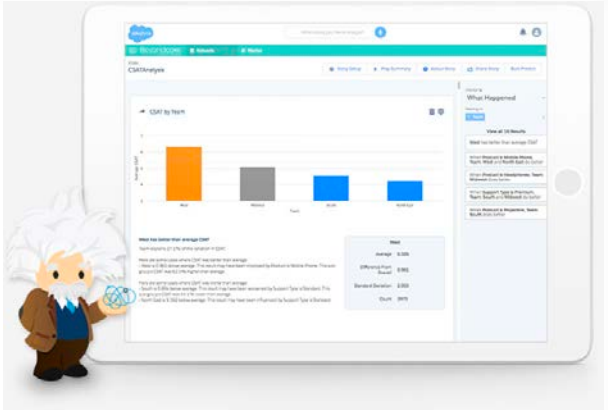


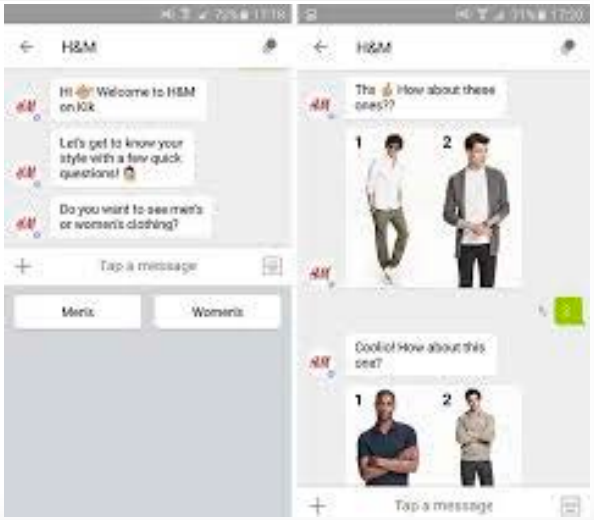


Application of AI - 8

AI in Sales & Customer service

- Intelligent CRM software analyzes sales process and data to discover opportunities in an unprecedented way
- For example, it's been proven that cold emails are 20% more effective on Tuesdays, and that making a follow-up call 10 minutes after an online registration leads to more conversion
- ML predicts which clients will unsubscribe, making it possible to contact them ahead of time to offer them incentives and provide them with specialized care to change their minds
- AI powered chatbots can address customer's questions immediately and address potential problems

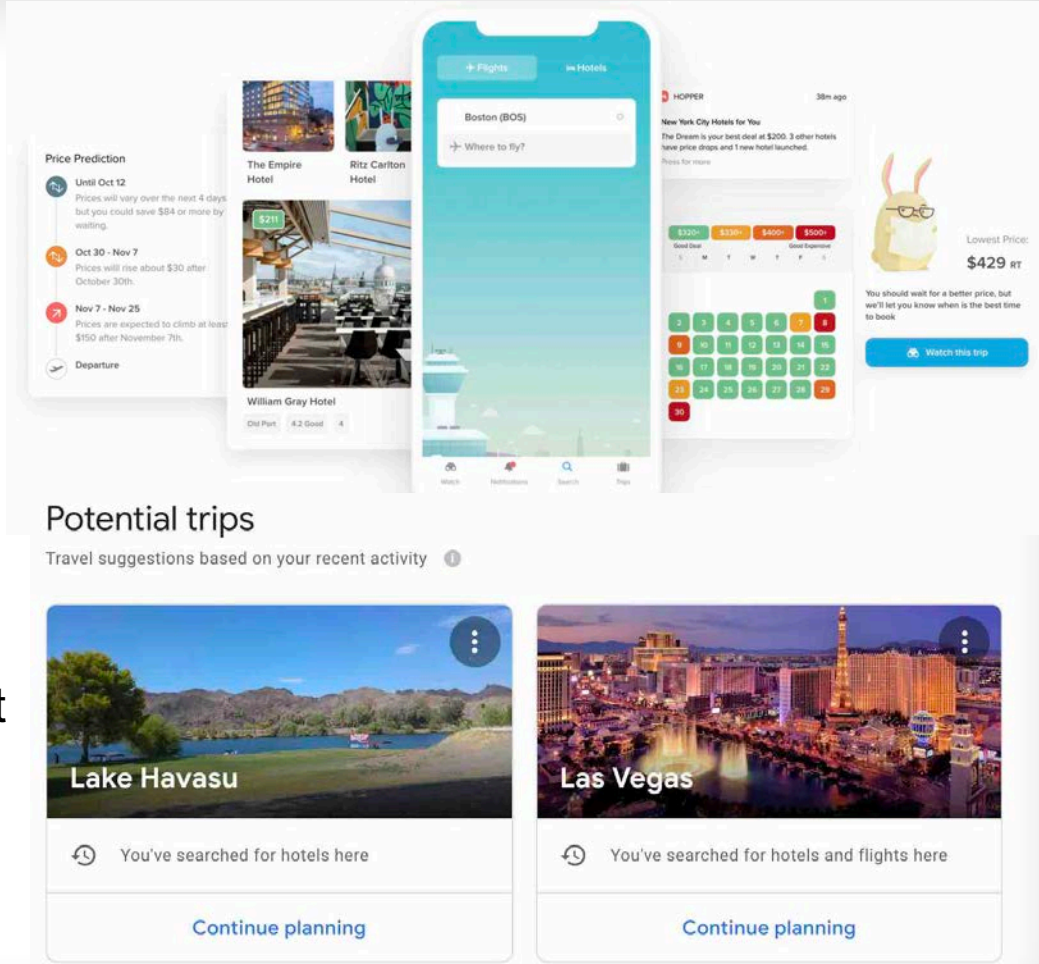




Application of AI - 9

AI in Travel & Entertainment

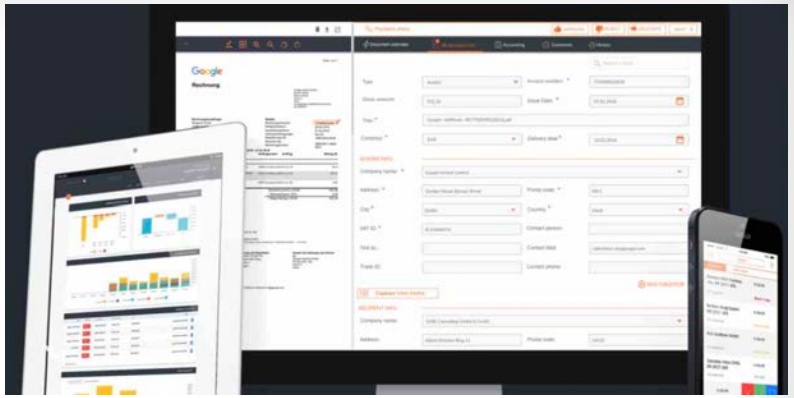
- Hopper predicts prices for flight and hotels with 95% accuracy up to 1 year in advance
- Using historic flight status data, Google Flights can predict some delays even when this information isn't available from airlines yet—and delays are only flagged when algorithm is at least 80% confident in the prediction
- In room assistants
- Reputation management

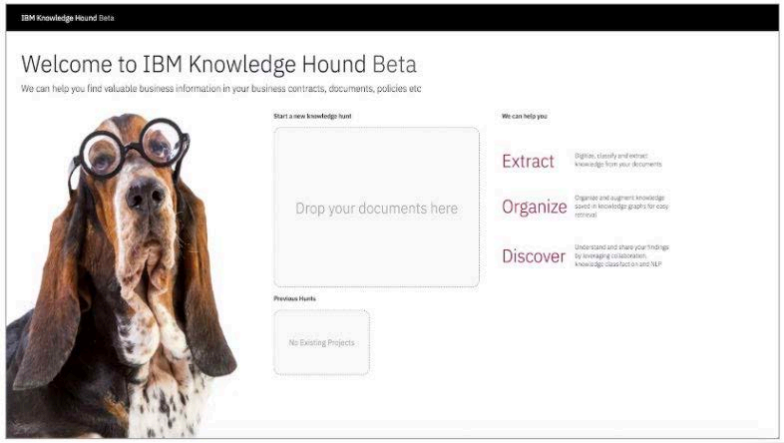


Application of AI - 10

AI in Accounting & Finance

- Smacc is an AI enabled account payable automation and workflow solution
- IBM knol - Knowledge extraction from a raw document
- Providing business meanings to cryptic metadata
- Helping businesses comply with Regulations using NLP technology
- Automating core banking solutions





Assignment #1

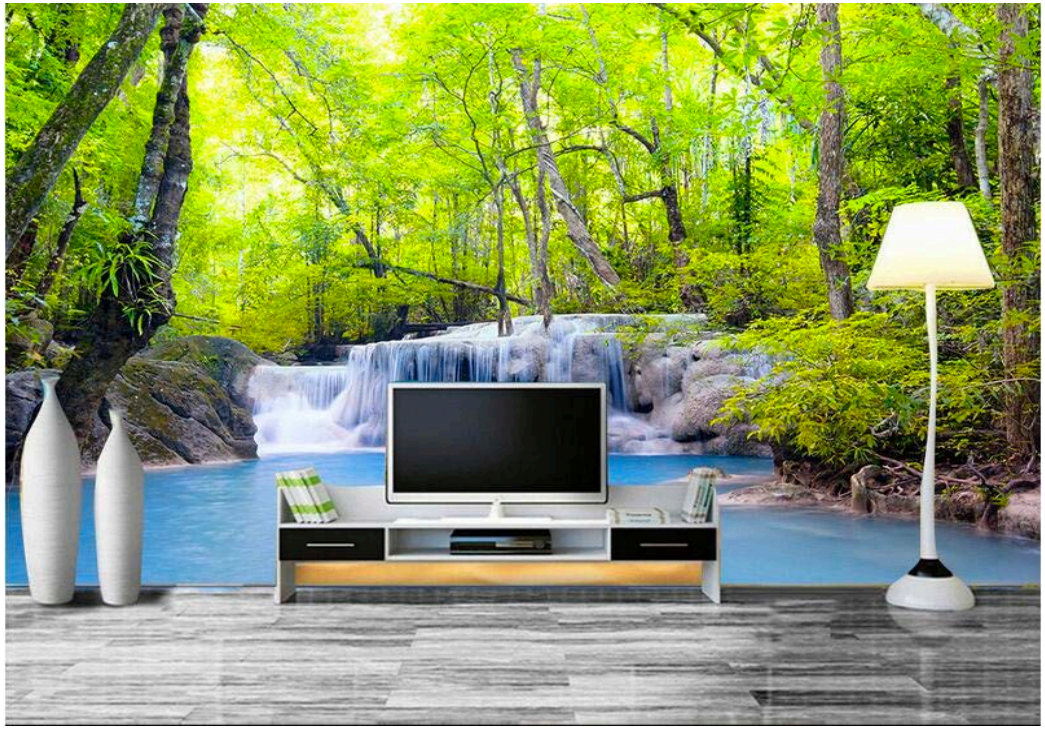
Consider the business or working environment of your choice such as sales, marketing, travel, finance, education, gaming – anything.

- Identify 2 -3 use cases that could be benefit from the implementation of AI (max 100 words per use case
- Submit in the google drive folder with file name in the format below:

  Firstname_lastname_assignment1

Intro to Computer Vision

Make computers understand images and videos



What kind of scene?

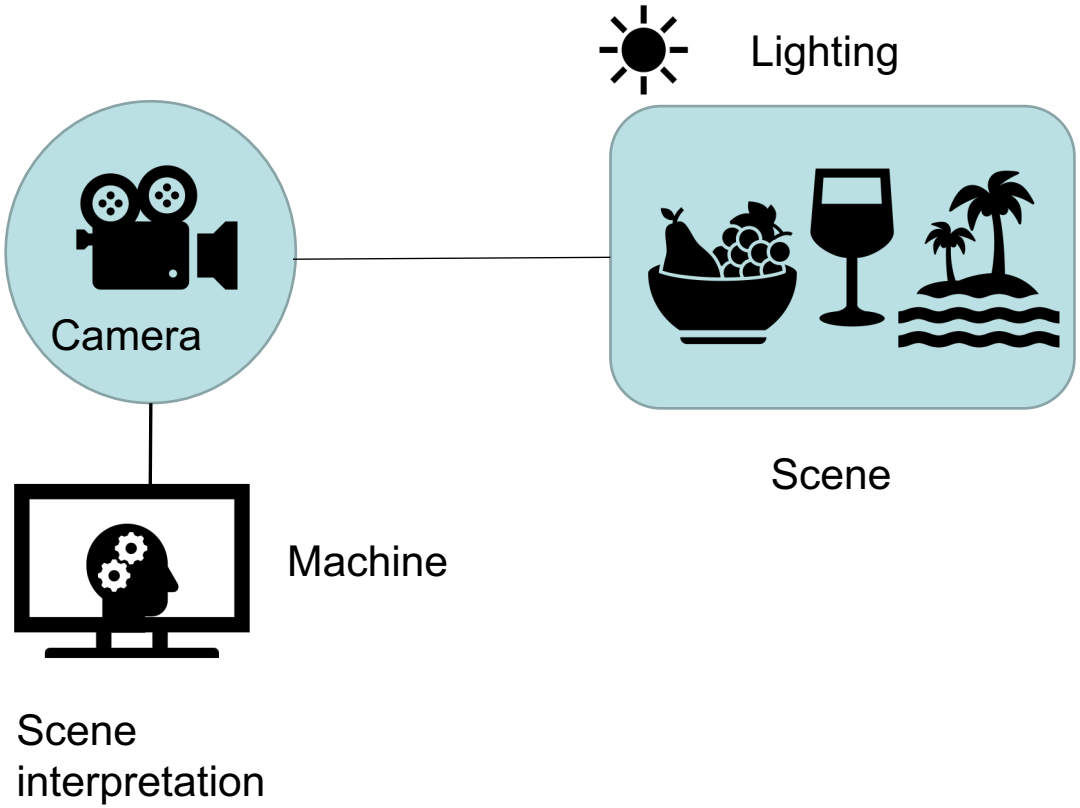
Where is the lamp?

How far is the TV?

…

Components of computer vision

The image data can take many forms, such as a video sequence, depth images, views from multiple cameras, or multi-dimensional data from a medical scanner



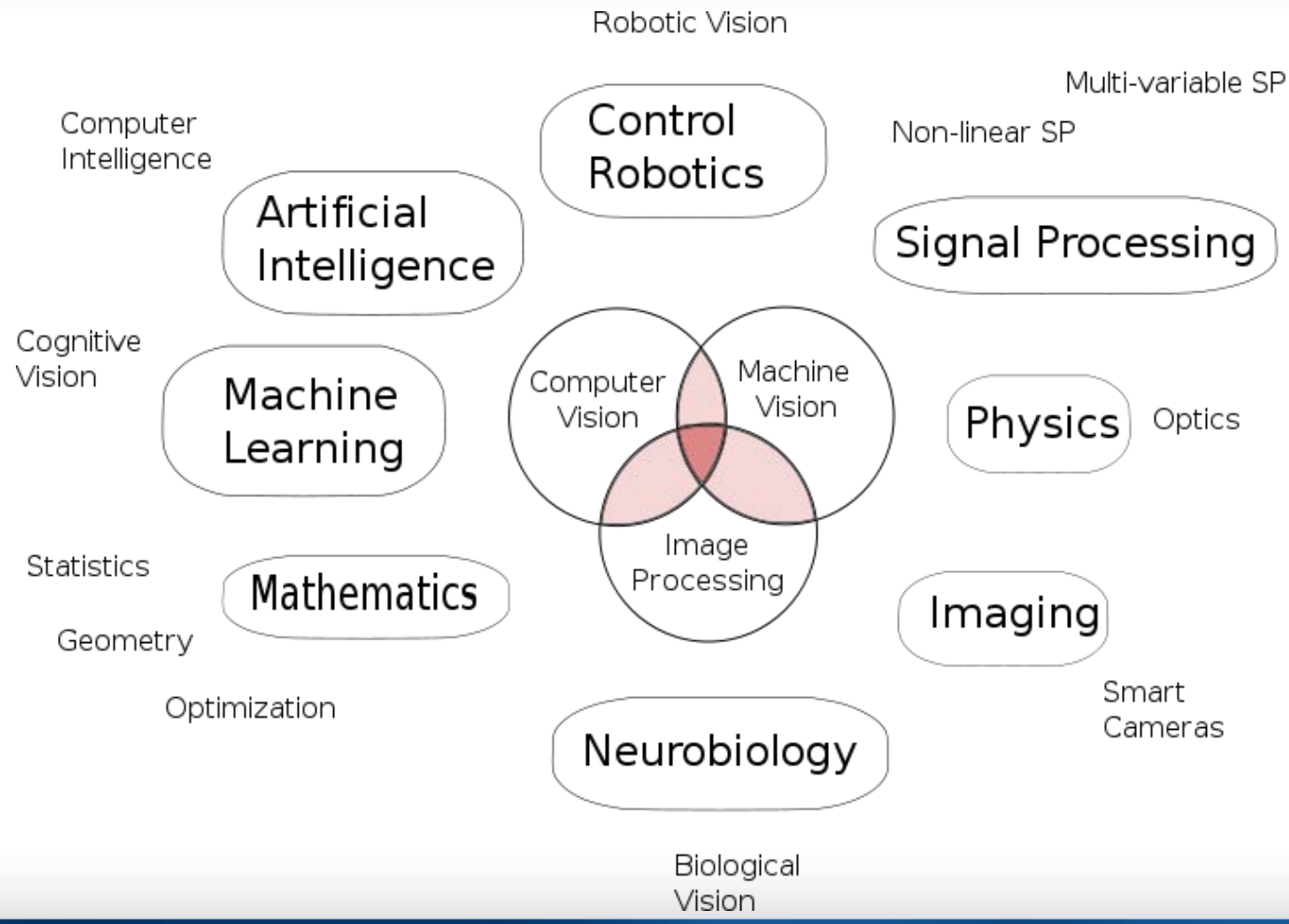
Machine vs human Vision

What we see

0	3	2	5	4	7	6	9	8
3	0	1	2	3	4	5	6	7
2	1	0	3	2	5	4	7	6
5	2	3	0	1	2	3	4	5
4	3	2	1	0	3	2	5	4
7	4	5	2	3	0	1	2	3
6	5	4	3	2	1	0	3	2
9	6	7	4	5	2	3	0	1
8	7	6	5	4	3	2	1	0

What a computer see

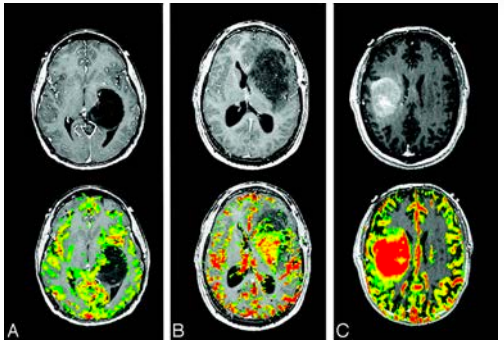
Vision is multi-disciplinary



Why computer vision matters

Safety

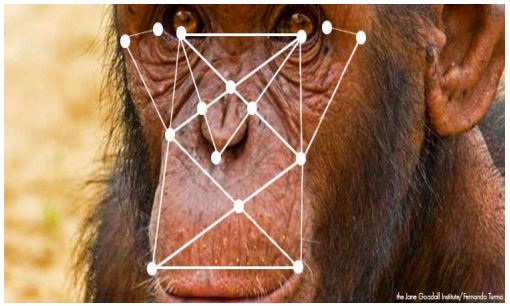
Security



Health

Fun

New species

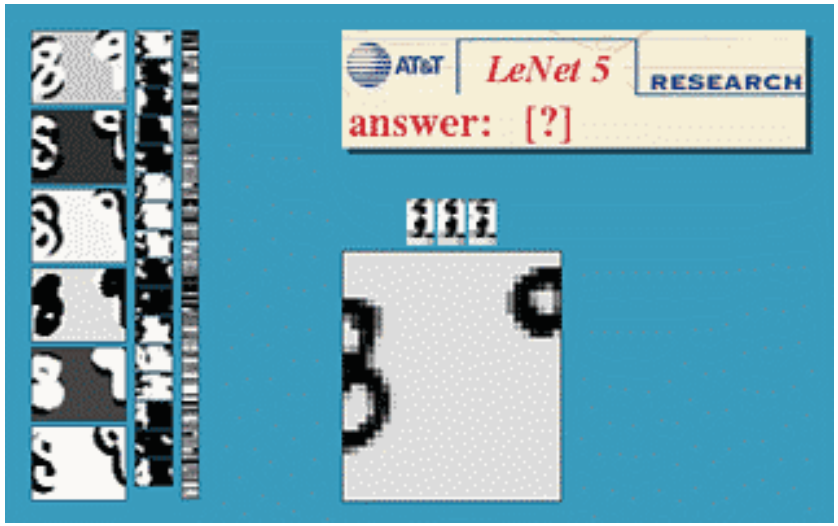


Extinction

How vision is used now - OCR

Technology to convert scanned docs to text

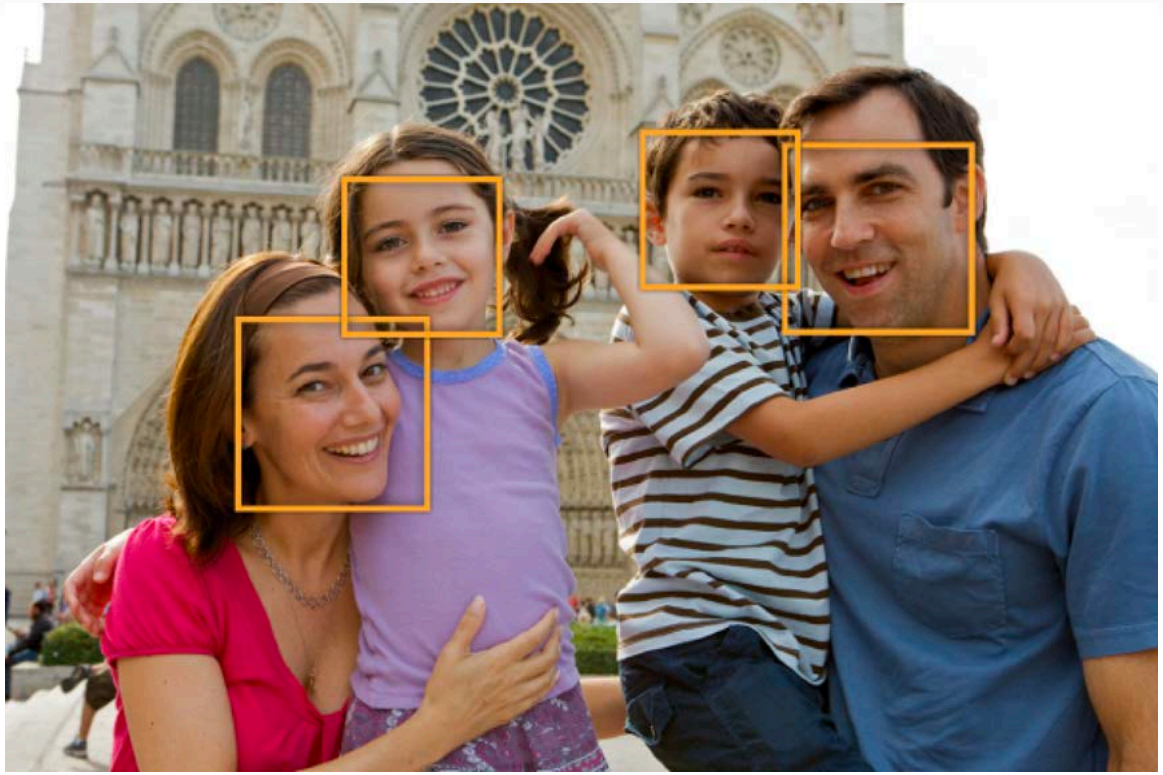
- If you have a scanner, it probably came with OCR software



Digit recognition

License plate recognition

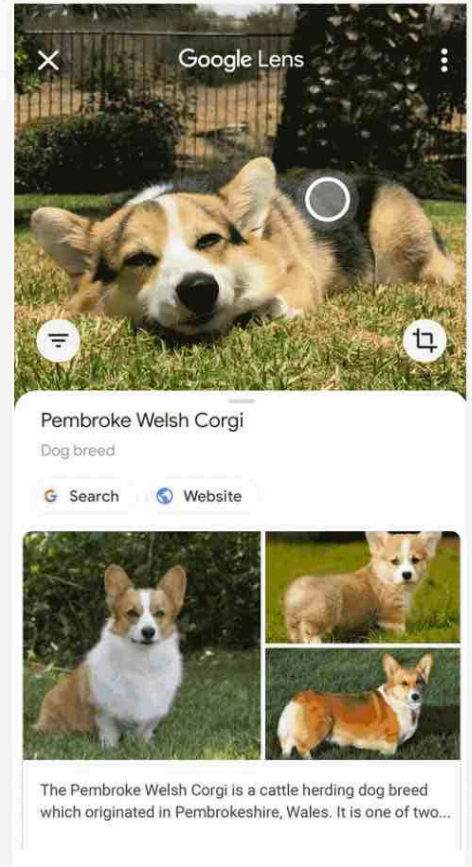
How vision is used now – Face detection



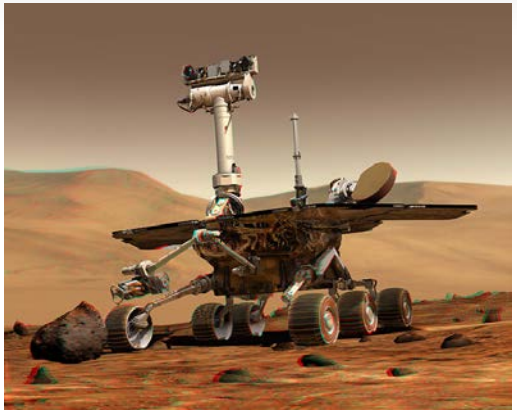
Almost all cameras now come with built-in face detection technology

How vision is used now – object detection

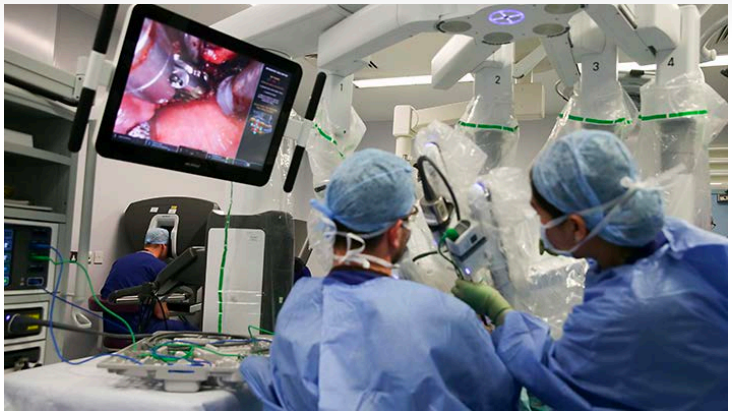
- Scan and translate text - Translate text in real time, look up words, add events to your calendar, call a number, and more.
- Identify plants and animals - Find out what plant is in your friend's apartment, or what kind of dog you saw in the park.



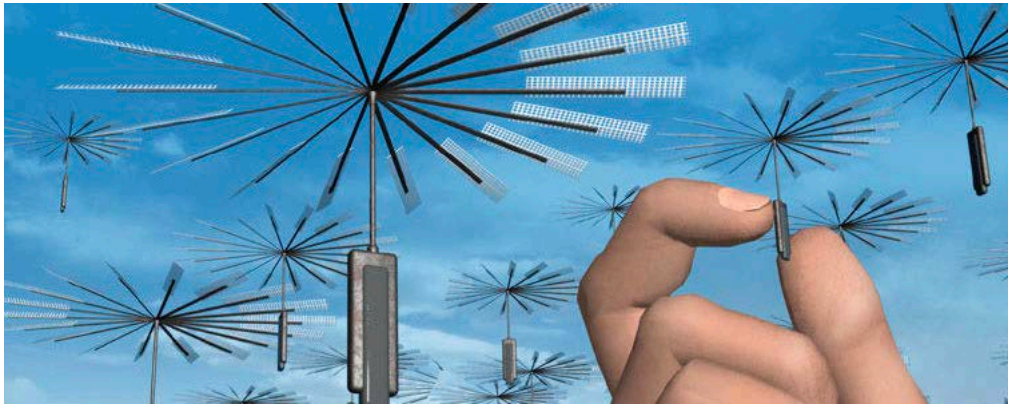
How vision is used now – Mobile robots



NASA's Mars spirit Rover



Robotic surgery



Smart dust in communication