

# How will AI change our daily life in the future?

**Tsz-Chiu Au**

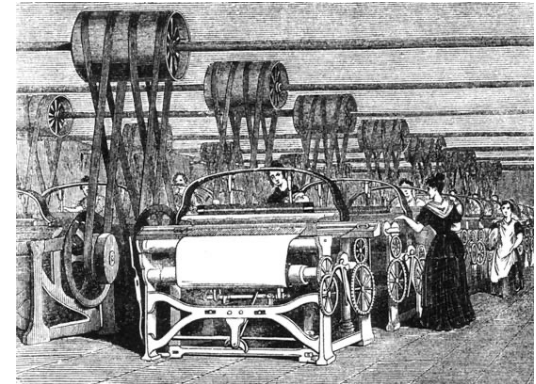
chiu@unist.ac.kr

Ulsan National Institute of Science and Technology (UNIST)  
South Korea



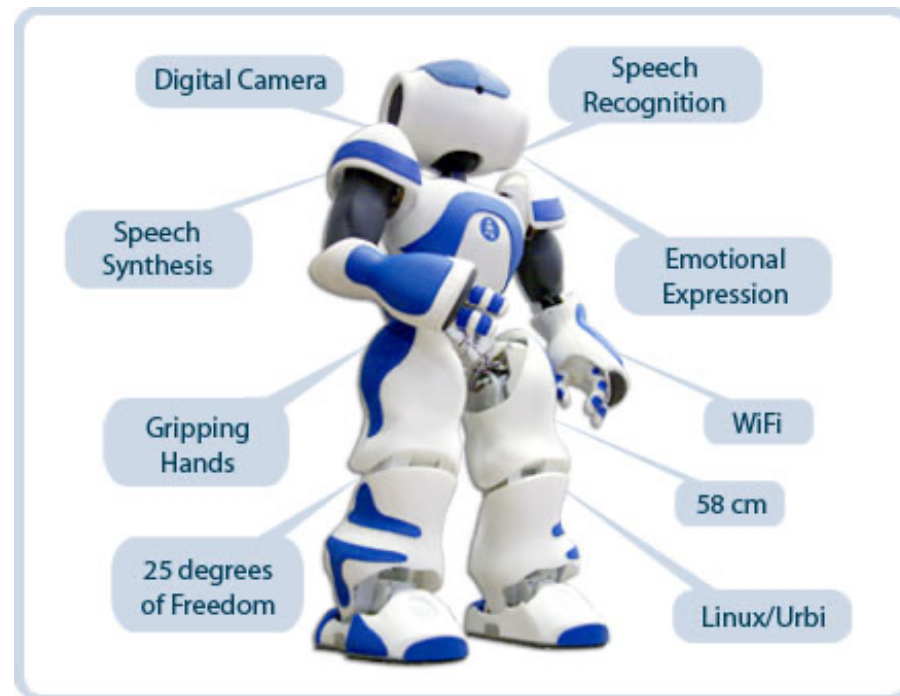
# Information Revolution

- The automation of information processing tasks by **computers**.
- **Computer science** is the main driving force.
- **Artificial Intelligence** is the key to the ultimate success.



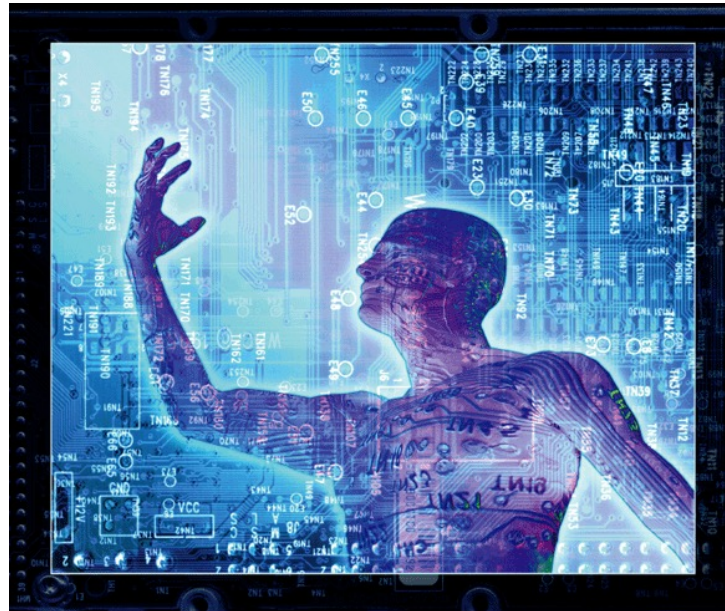
# What is Artificial Intelligence?

- Systems that *think* like humans
- Systems that *act* like humans
- Goal: imitate human intelligence



# Superintelligence

- Systems that think *better* than humans
- Systems that act *better* than humans
- Goal: achieve a high level of intelligence *beyond* human intelligence.

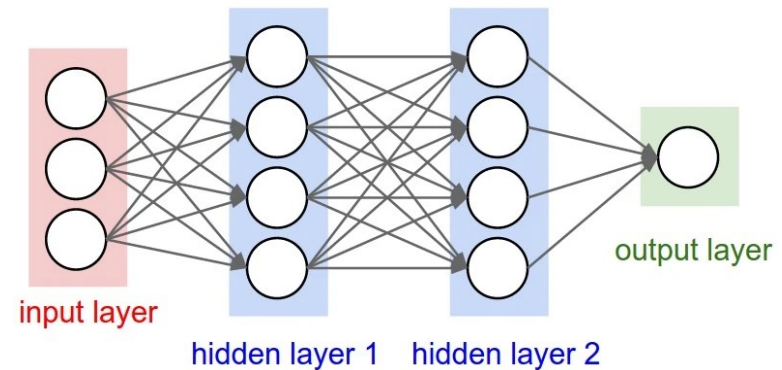
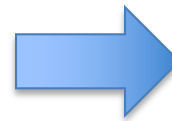
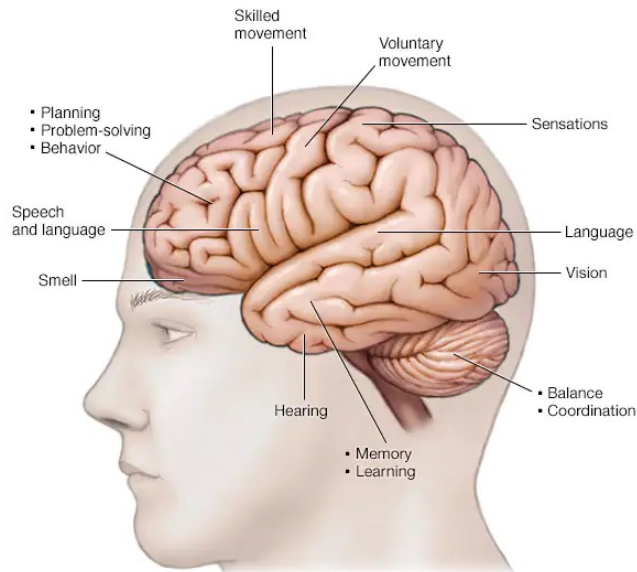


# A Short History of AI

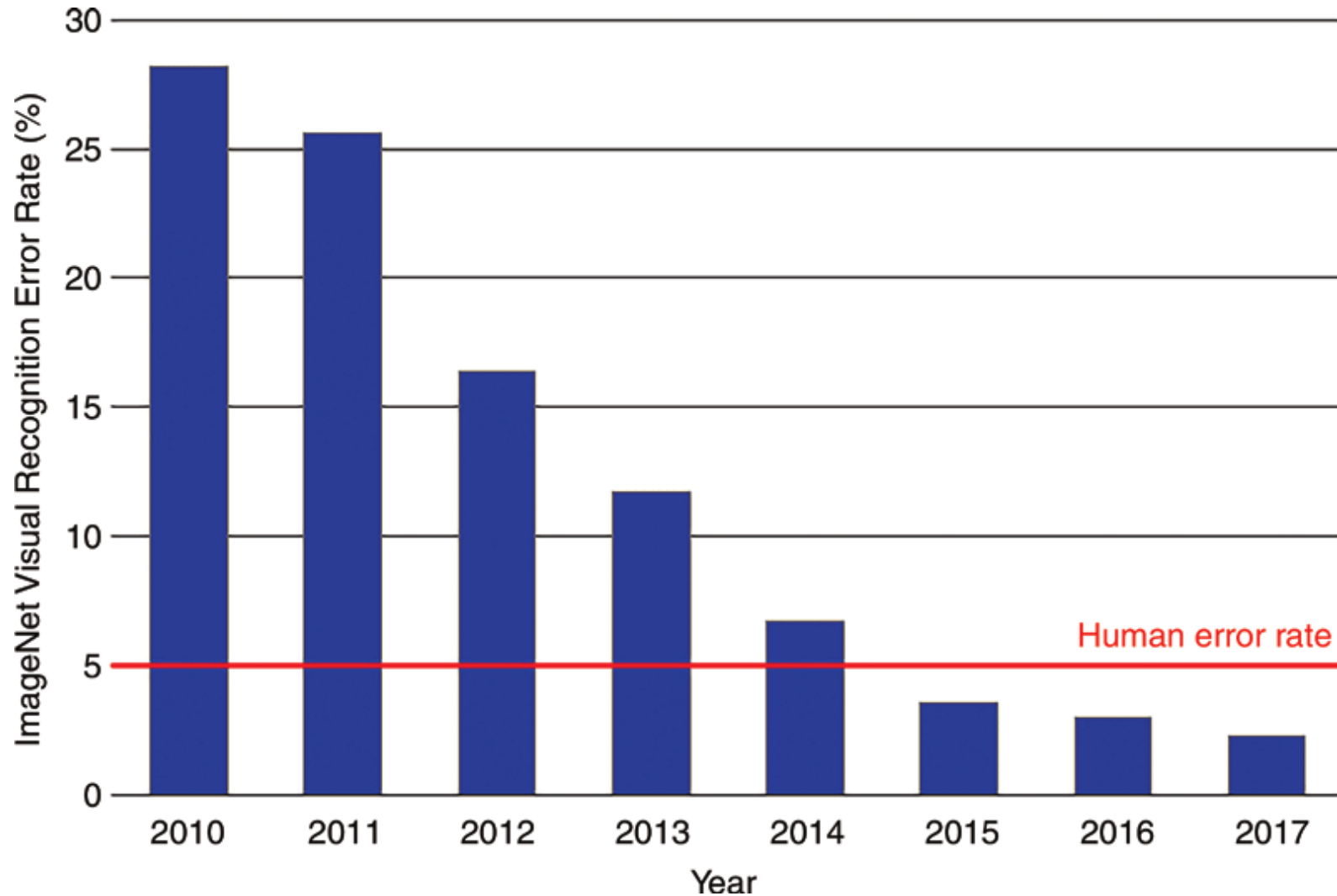
1930s-1940s	Digital computers
1950s-1960s	Machine translation Game-playing programs Automated theorem proving
1970s	Artificial neural networks
1980s	Expert systems Probabilistic reasoning
1990s-2000s	Increasing specialization of the field Machine learning
2010s-2020s	Deep learning (i.e., large-scale artificial neural networks)

# Artificial Neural Networks

Systems of **artificial neurons** inspired by the biological neural networks that constitute animal brains.



# Performance of Visual Recognition



# AI for Decision Making



# IBM Deep Blue – the Chess Playing Program



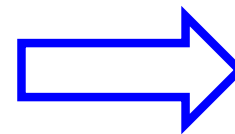
# Alpha Go



# IBM Watson – the Question-Answering Machine



THIS YELLOW  
CARTOON  
CHARACTER LIVES  
IN A PINEAPPLE  
UNDER THE SEA



Who is SpongeBob?

# Game Theory and Its Applications

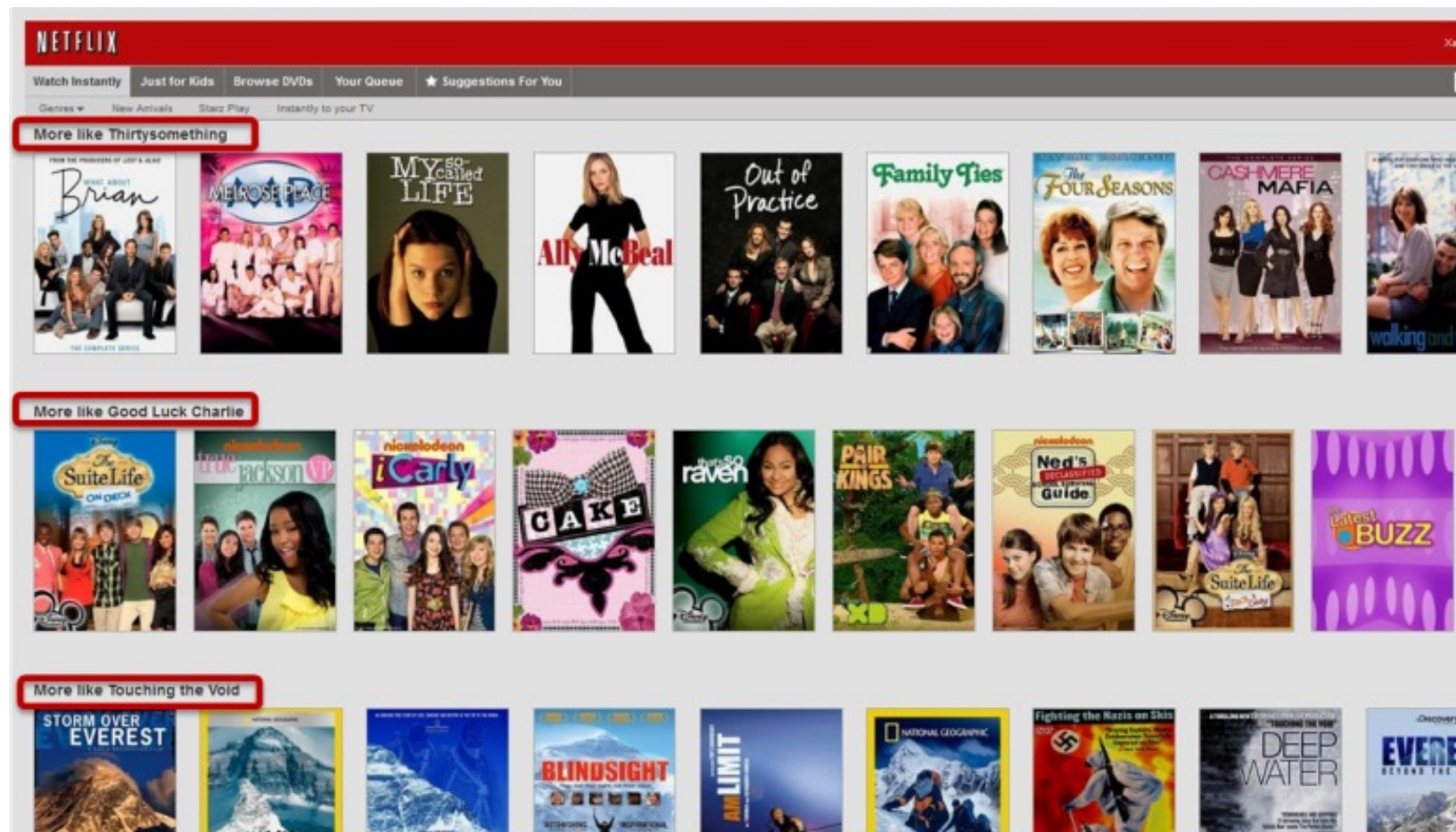
- **How can we design an environment such that players can behave in a desirable way?**
  - » Encourage cooperation
  - » Maximize fairness

## Prisoner's Dilemma:

		Prisoner B	
		Remain silent	Confess
Prisoner A	Remain silent	A gets 2 years B gets 2 years	A gets 8 years B gets 1 year
	Confess	A gets 1 year B gets 8 years	A gets 5 years B gets 5 years



# Recommendation Systems



# Intelligent Robots

# Boston Dynamics



<https://www.youtube.com/watch?v=tF4DML7FIWk>



# Robotic Dog



<https://www.youtube.com/watch?v=BMPWxcc-Xbk>



# Service Robots



# AI for Transportation

# Self-driving Cars



<https://www.youtube.com/watch?v=NJDypGjLoSs>

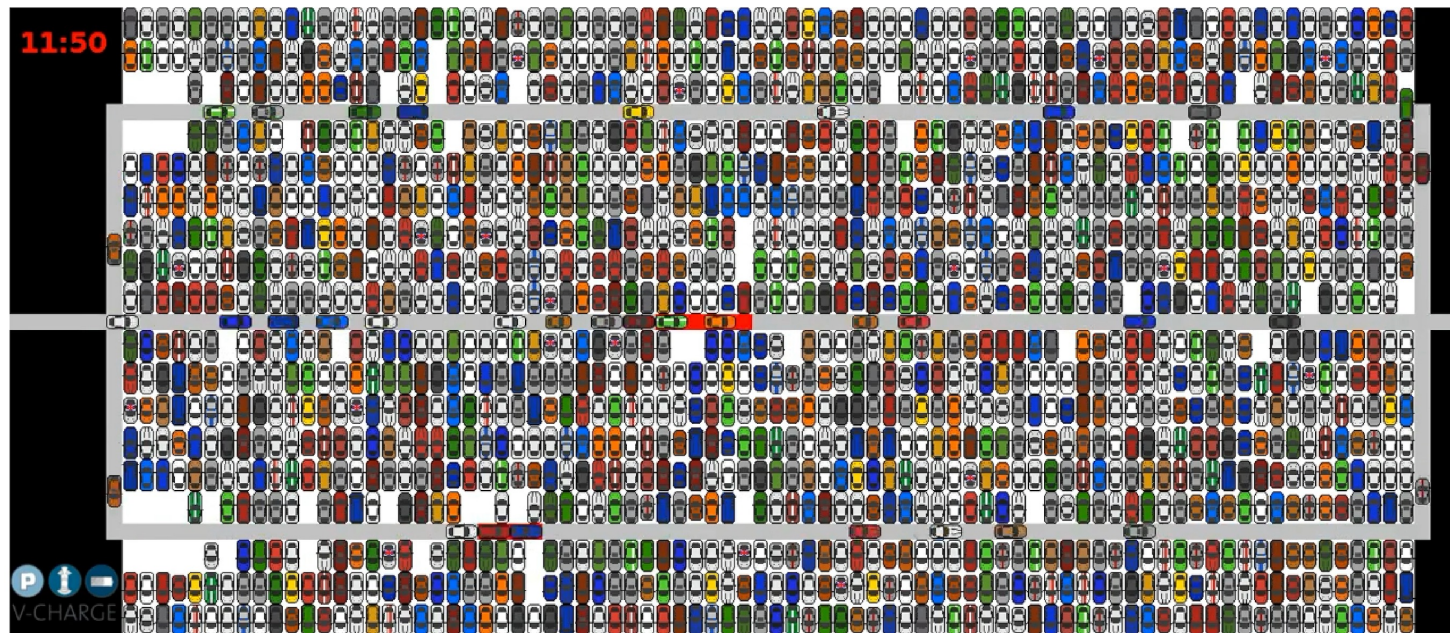
# Autonomous Traffic Management

What if these drivers are not  
humans but computers?



# Parking Lots for Autonomous Vehicles

**High-Density Parking (HDP):** utilize autonomous driving to greatly increase the capacity of conventional parking lots



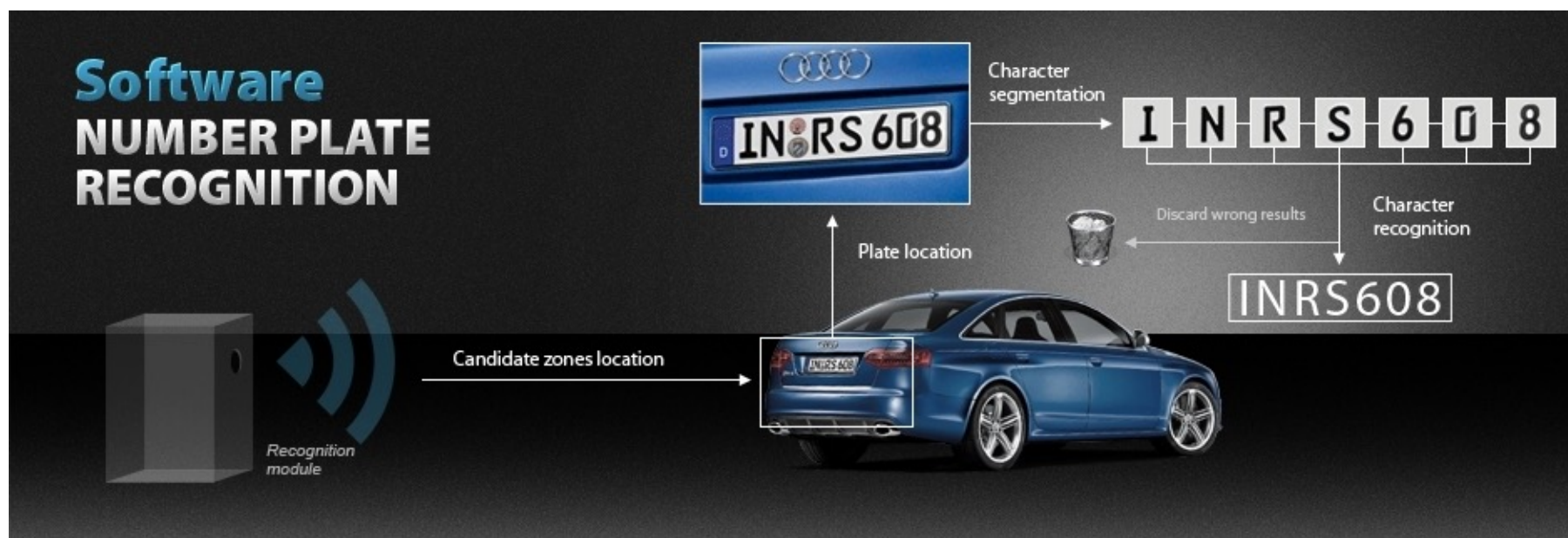
Source: <https://www.youtube.com/watch?v=pCzI-l8tsPY>

# Fully Autonomous Drones



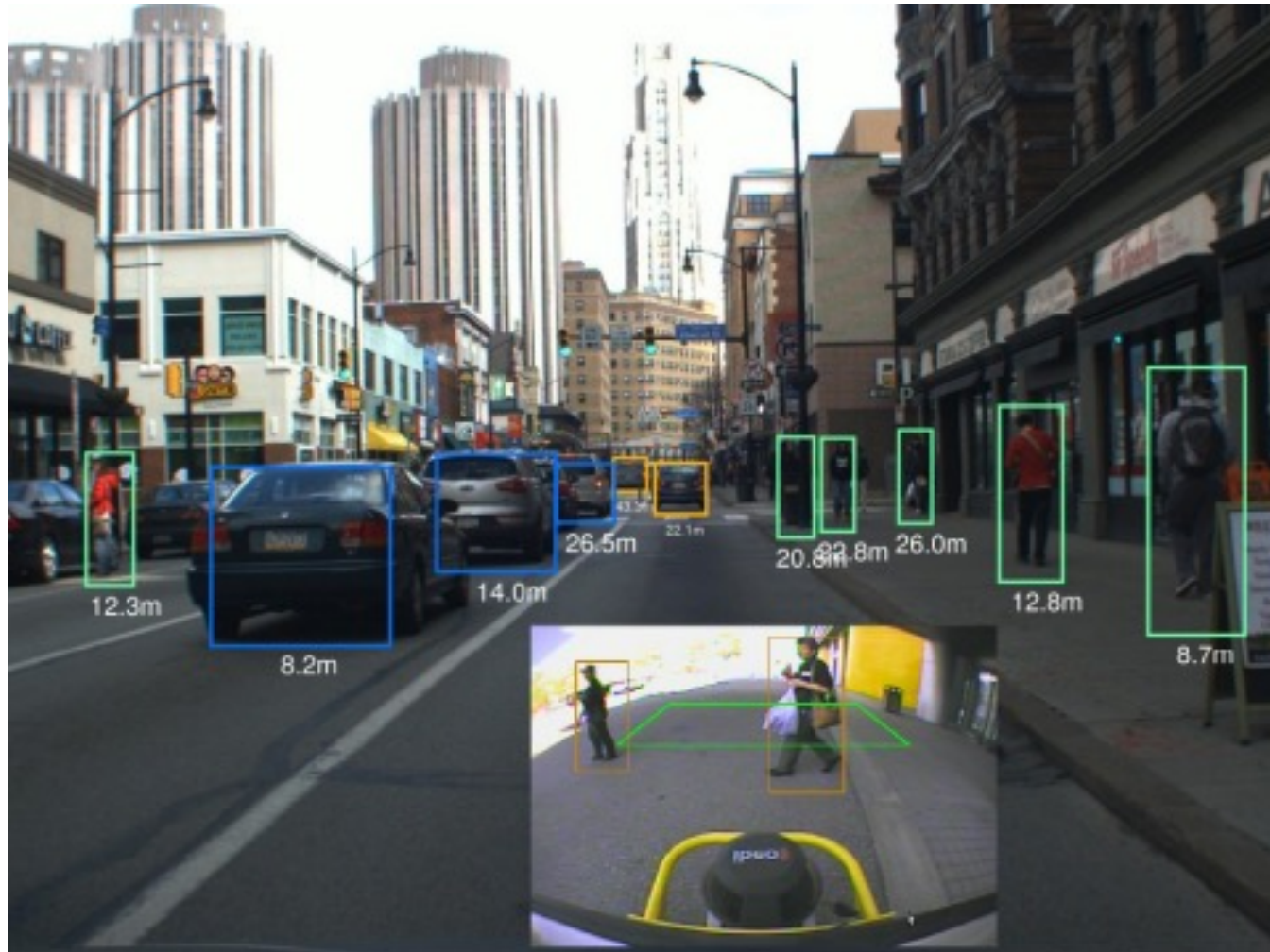
# Cognitive Tasks

# Text Recognition





# Visual Recognition



# Machine Translation

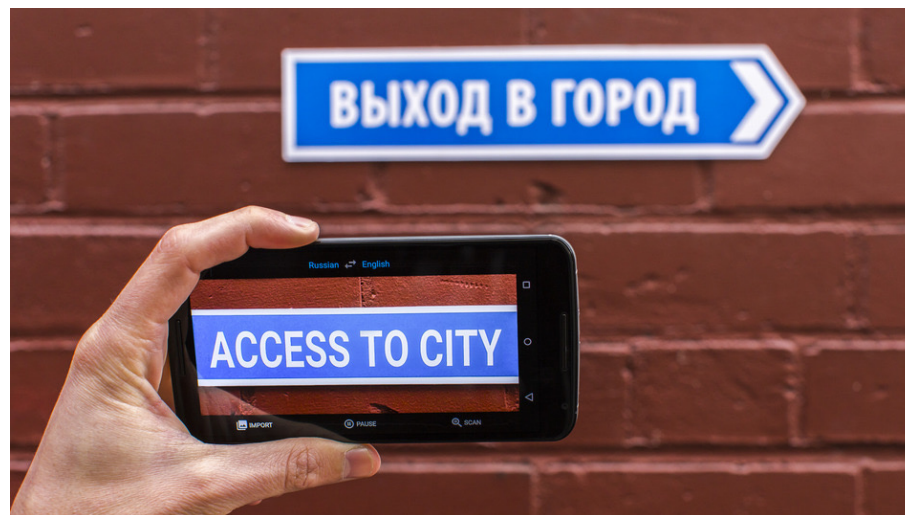
영어 한국어 독일어 언어 감지 ▼

↔ 한국어 영어 일본어 ▼ 번역하기

We will have one exam and one project throughout the semester. For project, you have to team up with others. ✕

우리는 하나의 시험과 학기에 걸쳐 하나의 프로젝트를 해야 합니다. 프로젝트의 경우, 다른 사람과 팀을 해야 합니다.

🎤 🔊 ⌨ ▼ ☆ 📄 Ä 🔊 ➦ ✎



# Speech Recognition



# AI for Art and Design

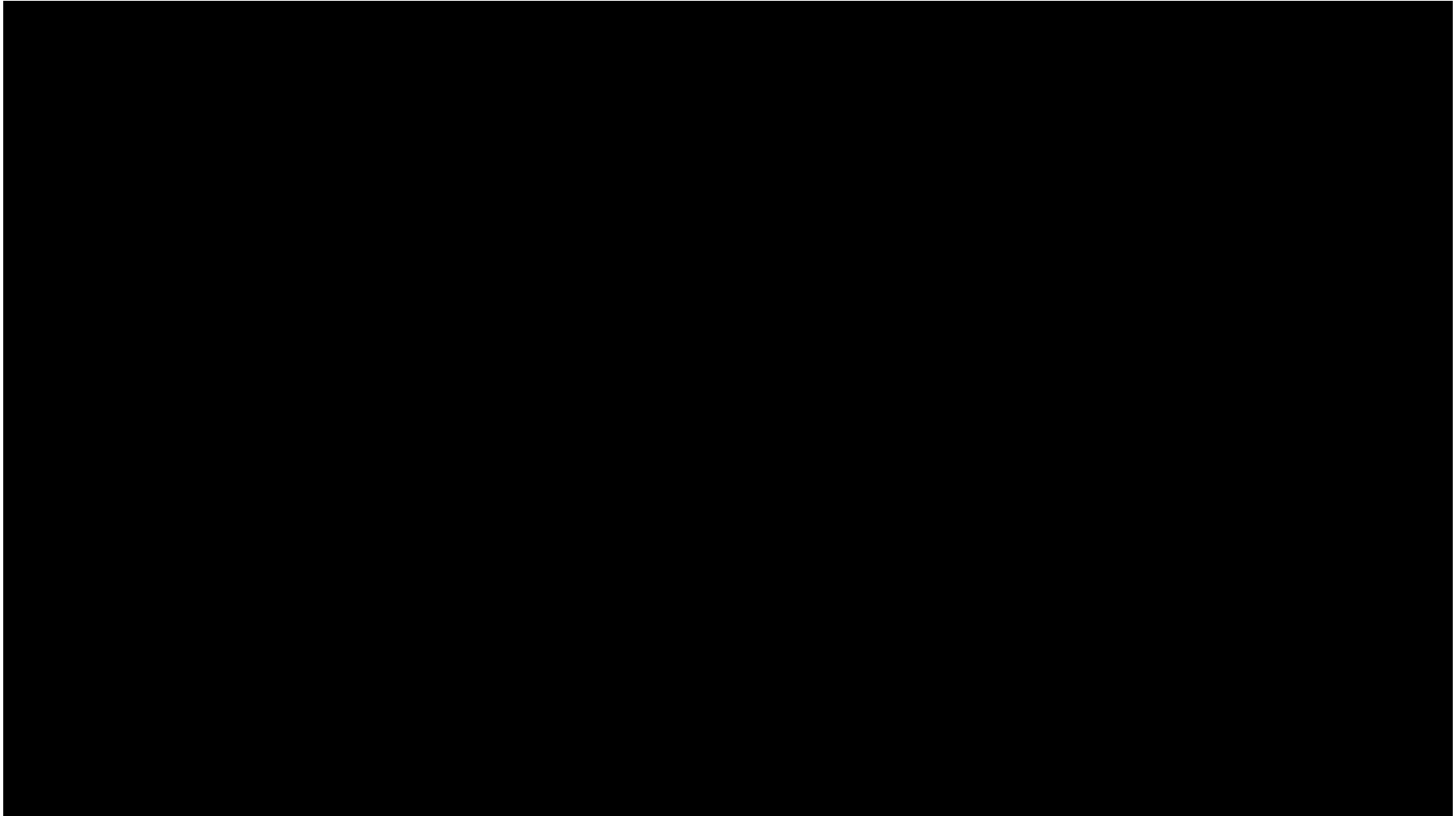
# DALLE-2

5. A propaganda poster depicting a cat dressed as French emperor Napoleon holding a piece of cheese





# DALLE-2



<https://www.youtube.com/watch?v=qTgPSKKjfVg>

# Architecture

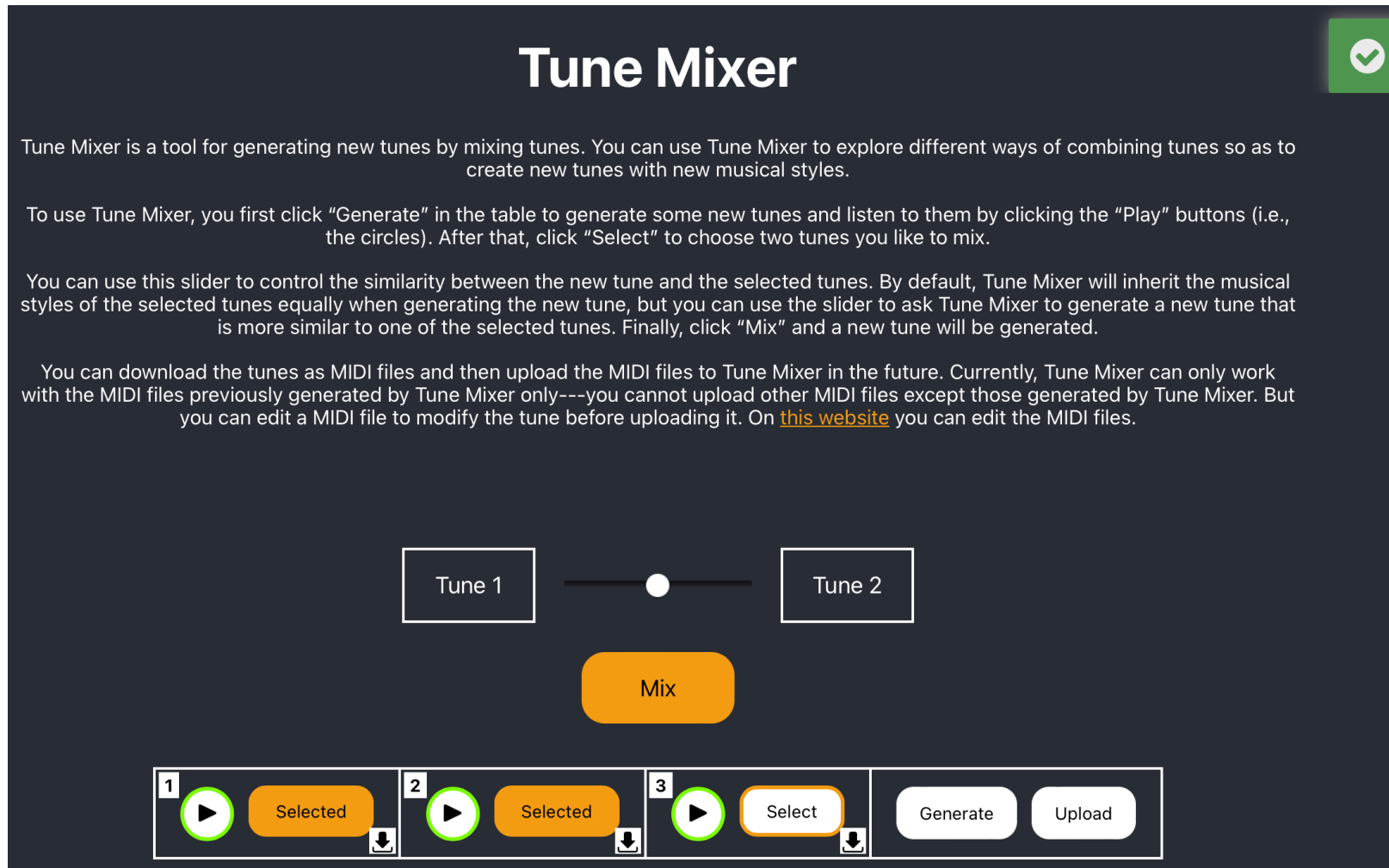


# Music Generation

[https://www.youtube.com/watch?v=LSHZ\\_b05W7o](https://www.youtube.com/watch?v=LSHZ_b05W7o)



# Tune Mixer



**Tune Mixer**

Tune Mixer is a tool for generating new tunes by mixing tunes. You can use Tune Mixer to explore different ways of combining tunes so as to create new tunes with new musical styles.

To use Tune Mixer, you first click "Generate" in the table to generate some new tunes and listen to them by clicking the "Play" buttons (i.e., the circles). After that, click "Select" to choose two tunes you like to mix.

You can use this slider to control the similarity between the new tune and the selected tunes. By default, Tune Mixer will inherit the musical styles of the selected tunes equally when generating the new tune, but you can use the slider to ask Tune Mixer to generate a new tune that is more similar to one of the selected tunes. Finally, click "Mix" and a new tune will be generated.

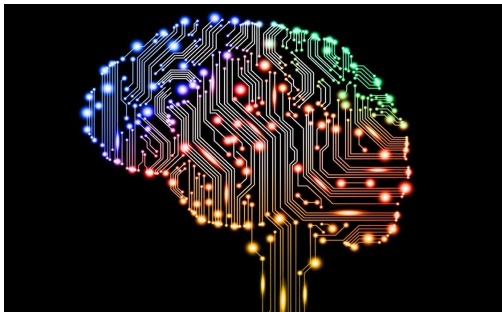
You can download the tunes as MIDI files and then upload the MIDI files to Tune Mixer in the future. Currently, Tune Mixer can only work with the MIDI files previously generated by Tune Mixer only---you cannot upload other MIDI files except those generated by Tune Mixer. But you can edit a MIDI file to modify the tune before uploading it. On [this website](#) you can edit the MIDI files.

The interface shows a slider between "Tune 1" and "Tune 2" with a "Mix" button below it. At the bottom, there is a control bar with three numbered items (1, 2, 3). Item 1 has a play button and a "Selected" button. Item 2 has a play button and a "Selected" button. Item 3 has a play button and a "Select" button. To the right of these are "Generate" and "Upload" buttons.

[https://ai.unist.ac.kr/~chiu/Tune\\_Mixer](https://ai.unist.ac.kr/~chiu/Tune_Mixer)

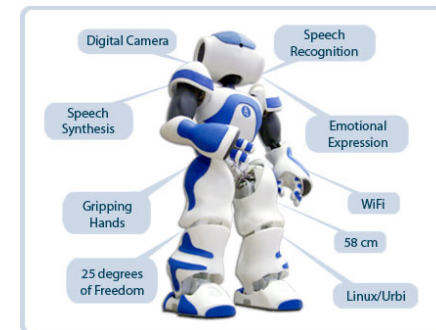
# AI in the future

The ongoing information revolution will continue to lead our economic and social development.



Artificial Intelligence is the key to the success of full automation of information processing tasks.

AI will change **every aspect** of our daily life in the future.



**Thank You!**