Sign Language Detector

AiTP

Project for 1st year 2023/2024

Borg El Arab Technological University Information technology Department

Meet our Team

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problem definition

- According to WHO globally there are 1.5 billion deaf people and this numbercould increase to 2.5 billion by the end of 2050.
- Difficulty in participating in verbal conversations
- Difficulty in forming and maintaining social relationships
- Limited access to public services and facilities that are deaf-friendly
- Difficulty in using telecommunication devices that rely on sound

Project idea

make an application to Recognition of hand gestures in 3D space using a single low resolution camera for converting Sign Language into any spoken language.

use cases:

- Deaf people can have a common classroom by asking their questions/doubts without any hesitation
- Inclusion of this community in normal schools.
- Tourist Guides can communicate better using sign language.

HOW DO WE DO THAT?

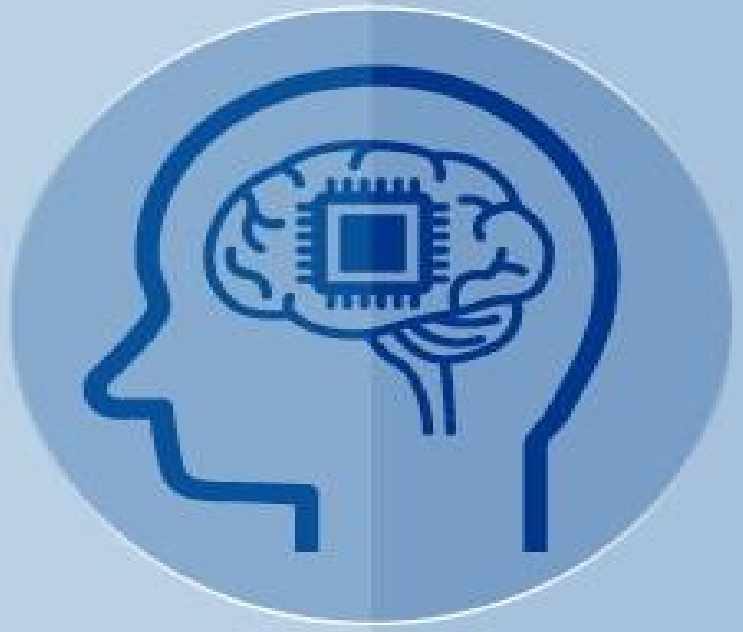
هنعمل كدة ازاى؟

The Technology Used

Some concepts about the technology used in building the project in the following slides.

AITP

Artificial Intelligence



Engineering of making Intelligent Machines and Programs

Machine Learning

Ability to learn without being explicitly programmed

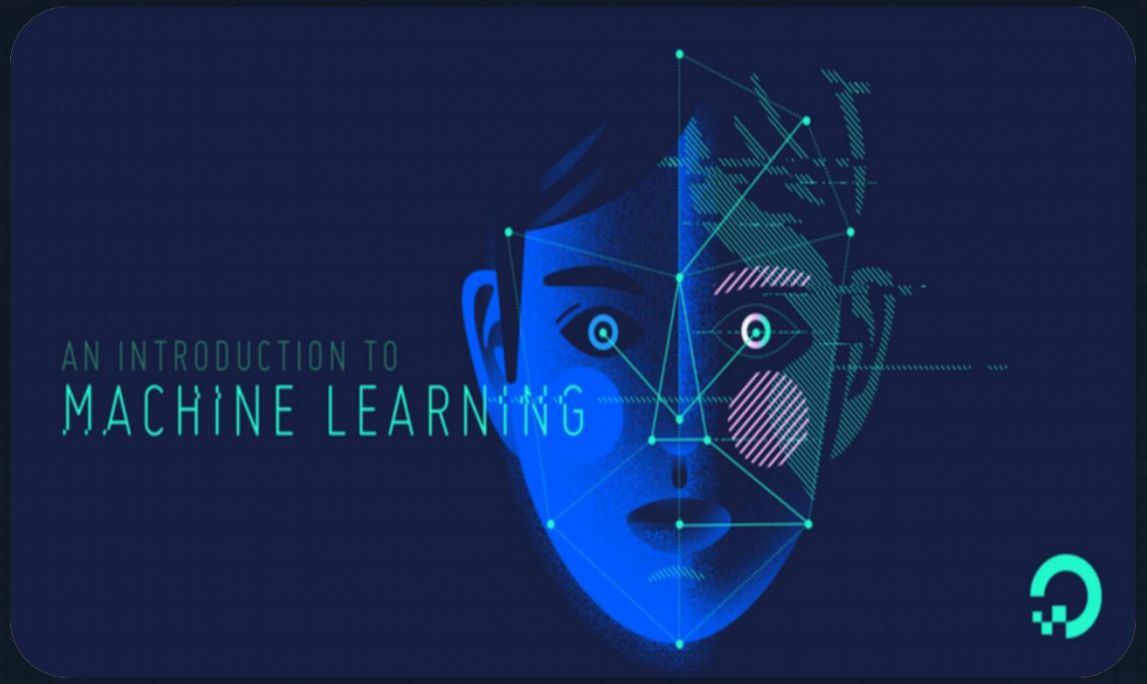
Deep Learning

Learning based on Deep Neural Network

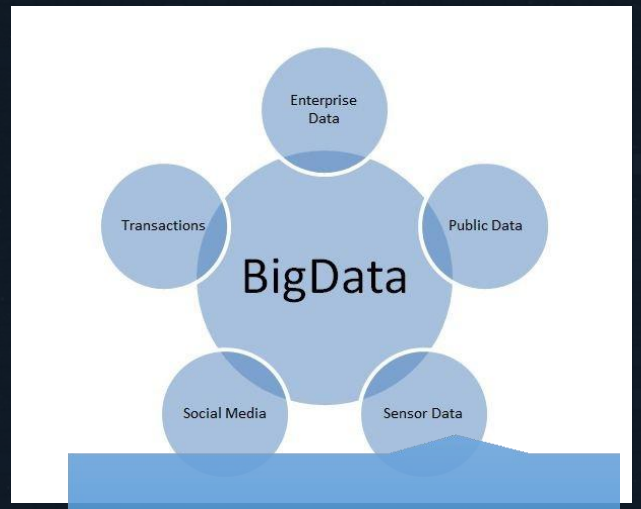
1950's 1960's 1970's 1980's 1990's 2000's 2006's 2010's 2012's 2017's

Machine Learning

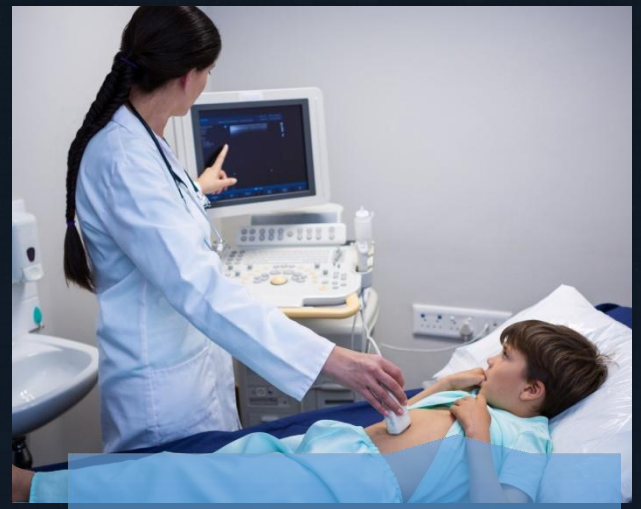
Machine Learning is a branch of artificial intelligence that enables computer systems to learn and evolve from data without being explicitly programmed.



Machine Learning



Big Data Analysis

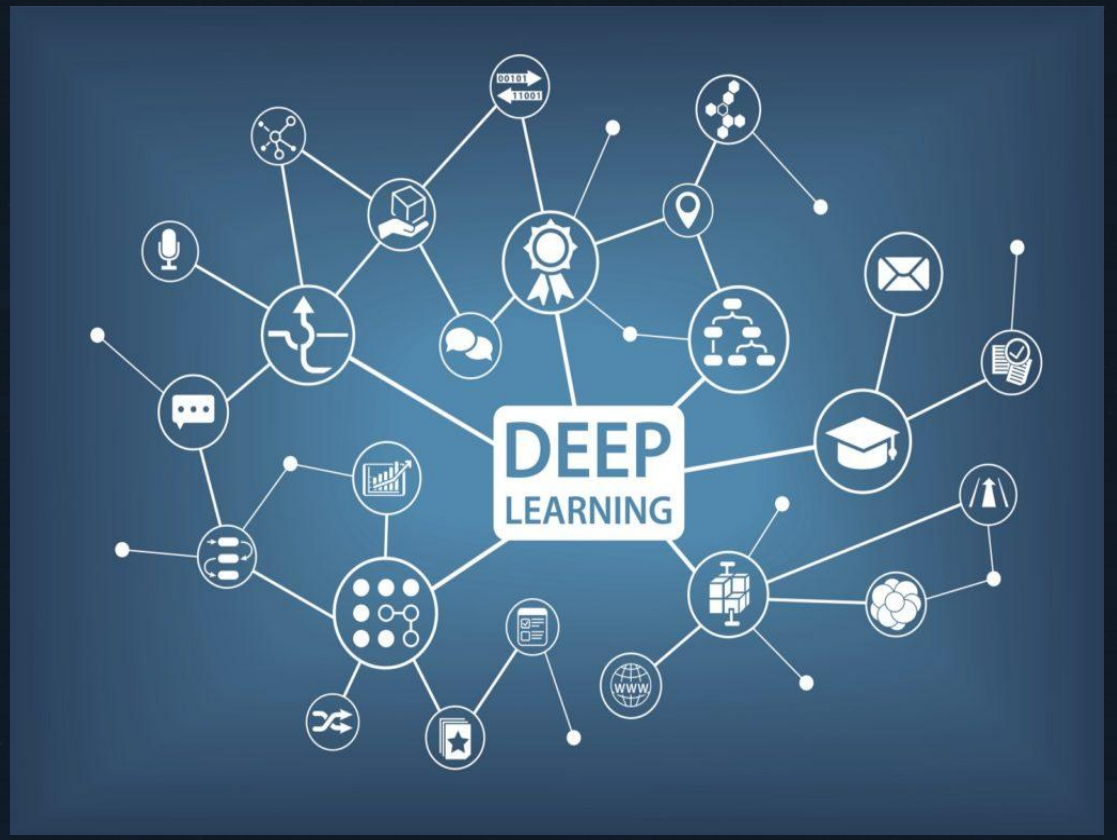


Medical Diagnosis

Personalized Recommendations

Deep Learning

Deep Learning is a subset of machine learning that uses deep neural networks to mimic the way the human brain processes data and makes decisions.



Deep Learning

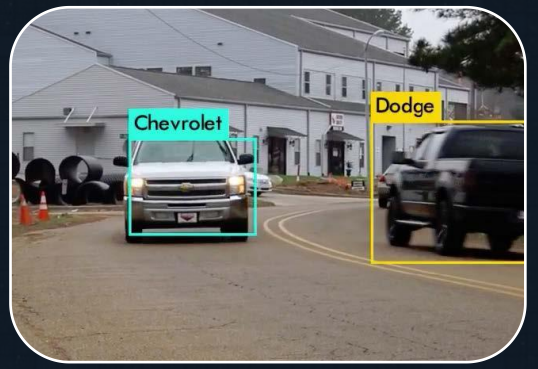
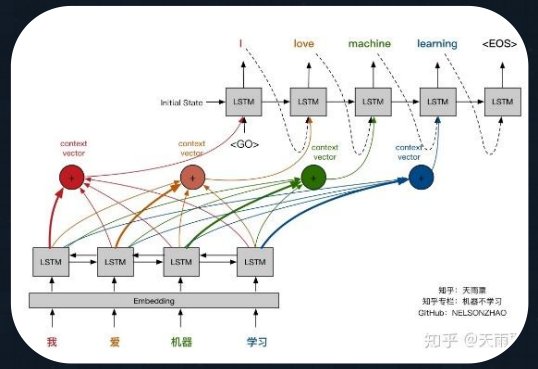


Image Recognition

Speech Recognition



Natural Language Processing

Autonomous Driving

Types of neural networks

1. Convolutional Neural Networks (CNN)
2. Recurrent Neural Networks (RNN)
3. Feedforward Neural Networks (FFN)

computer vision:

- **seeks to automate tasks that the humman visual system can do**
- **Goal of computer vision: to bridge the gap betweenpixels and meaning**

usage in our project

- we will use computer vision to detect hand and recognize the movement and know what is the meaning of the sign and give me that in output like sound

computer vision can be achived by:

- Classical image processing methods
- Deep learning methods

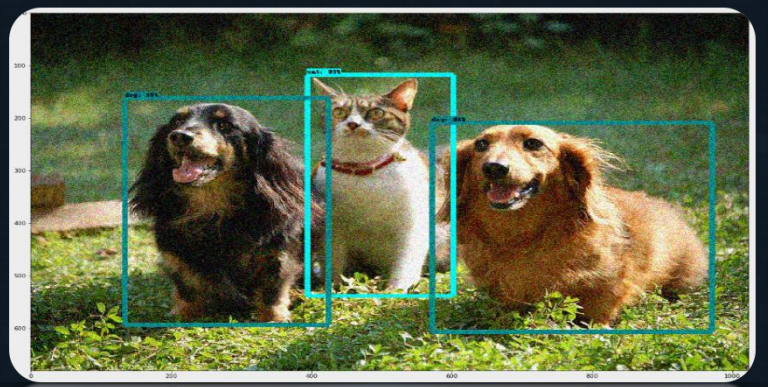
Computer vision:

Computer Vision is a field of artificial intelligence and machine learning that enables computers to interpret and understand digital images and videos.

Computer vision:

Image Recognition

Identifying and classifying objects or people in images.



Object **Detection**

Locating various objects within images and videos.

Face Recognition

Identifying individuals based on their facial features.

The most important libraries used

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OUR TECHNOMAGIC

NumPy

1. Statistical analysis
2. Image processing
3. Scientific model simulations
4. Machine learning

OpenCV

1. Facial recognition
2. Object detection
3. Medical image processing
4. Robotics

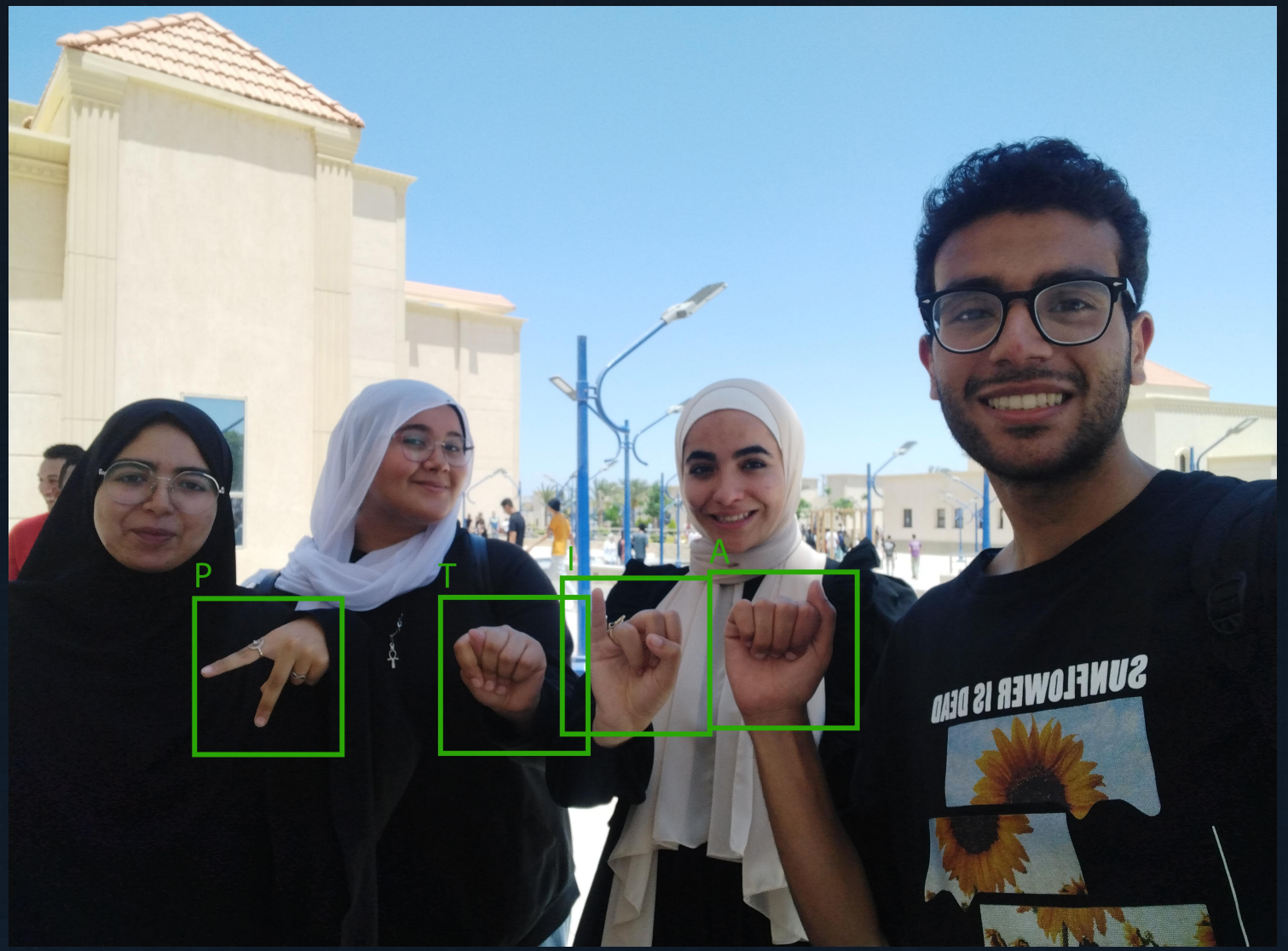
PyTorch

1. Deep learning in image processing
2. Natural Language Processing (NLP)
3. Generative Adversarial Networks (GANs)
4. Personalized recommendations

MediaPipe

1. Hand tracking
2. Face detection
3. Human pose estimation
4. Hair and skin segmentation

Output: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SUNFLOWER IS DEAD

AIFP
DELL

DELL

THANKS FOR LISENNING!

LEARN MORE