ARTIFICIAL INTELLIGENCE

- **Artificial Intelligence (AI)**
  - Is the intelligence exhibited by machines or software

- The branch of computer science that develops machines and software with human-like intelligence. (*Wikipedia*)

- **Watch this VDO!**
  - https://www.youtube.com/watch?v=ai7gN7v-_tg

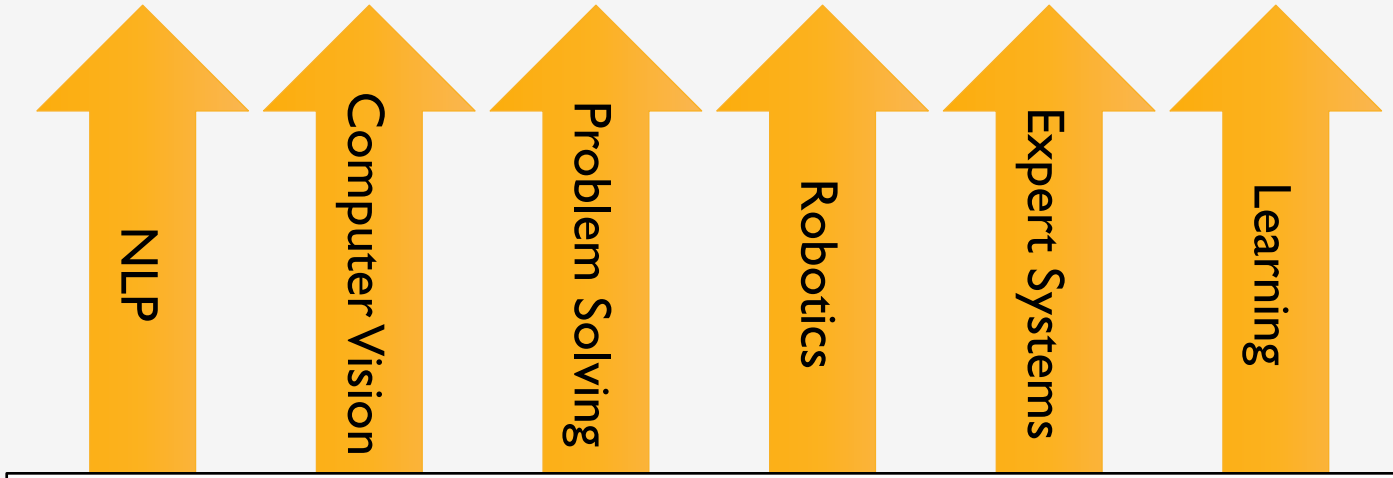
BRANCHES OF AI

The various attempts at formally defining the use of machines to simulate human intelligence let to several **AI branches**

1. **Natural Language Processing (NLP)**
2. **Computer Vision**
3. **Robotics**
4. **Problem-solving and planning**
5. **Learning**
6. **Expert Systems**

BRANCHES OF AI

Human-like artificial creatures
Other artificial creatures
Special robots/machines with higher capabilities



Artificial Intelligence

BRANCHES OF AI

- How successful we have been in creating ***human-like artificial creatures***?

- **Watch this interesting VDO**
  - https://www.youtube.com/watch?v=MaTfzYDZG8c

NATURAL LANGUAGE PROCESSING

NLP understands and generates languages that humans use naturally so that eventually you will be able to address your computer as though you were addressing another person (e.g. ELIZA)

Watch this interesting VDO

- https://www.youtube.com/watch?v=kpYRZNm8__8

NATURAL LANGUAGE PROCESSING

- **NLP Categories:**
  - **Phonology**: modeling the pronunciation of words (chair, car, cell)
  - **Morphology**: identifying the structure of words (dog, dogs, hot dogs)
  - **Syntax**: identifying grammars
  - **Semantics** : understanding and representing the meaning

NATURAL LANGUAGE PROCESSING

- **Applications:**
  - Automatic text indexing
  - Grammar and style analyser
  - Automatic text generation
  - Machine translation
  - Optical character recognition (OCR)

COMPUTER VISION

Computer vision is a field that includes methods

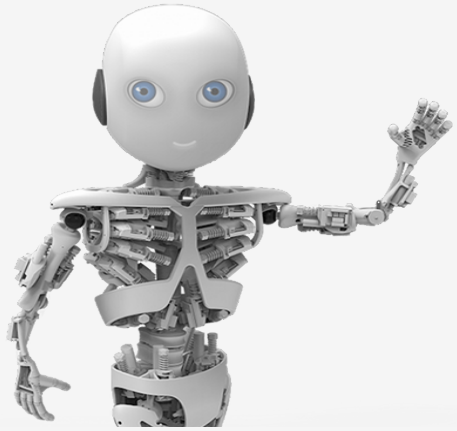
- for acquiring, processing, analysing, and understanding images and high-dimensional data
- From the real world in order to produce numerical or symbolic information, e.g., in the forms of decisions.

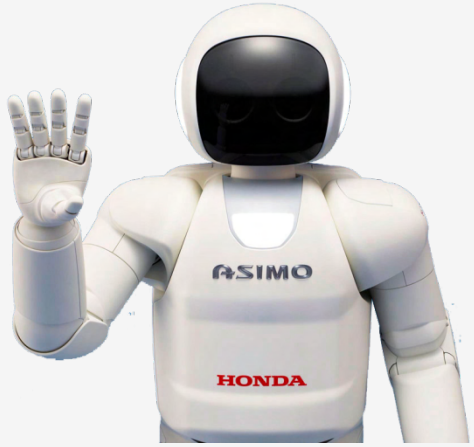
COMPUTER VISION

- **Applications:**
  - **Recognize objects** (e.g. people we know and things we own)
  - **Locate objects in space** (to pick them up?)
  - **Track objects in motion** (catching a baseball, avoiding collisions with cars on the road)
  - **Recognize actions** (e.g. walking, running, pushing)

ROBOTICS

Robotics involves the control of actuators on robots to move, manipulate or grasp objects, locomotion of independent machines and use of sensory input to guide actions.





PROBLEM SOLVING & PLANNING

- **This includes:**
  - **refinement** of high-level goals into lower-level ones
  - **determination** of actions to achieve goals
  - **revision of plans** based on intermediate results
  - **focused search** of important goals

- **Watch this intersting VDO**
  - https://www.youtube.com/watch?v=pT85obwa7P8

LEARNING

- **Learning** concerns the construction and study of systems that can learn from data
- **Machine Learning vs. Data Mining**
- **Watch these interesting VDOs**
  - https://www.youtube.com/watch?v=-rMMTv7XLYw
  - https://www.youtube.com/watch?v=tjmOnFLsigQ

EXPERT SYSTEMS

- **Expert systems** deal with the *processing of knowledge* as opposed to processing of data
  - Involves the development of computer software to solve complex decision problems
  - A computer system that **make decisions on behalf of human**.
- **Watch these his interesting VDOs!!!**
  - Knowledge based system : https://www.youtube.com/watch?v=MxI_tzOs6ME
  - Medical Expert System : https://www.youtube.com/watch?v=uWEahgy3Iyc

ANY QUESTIONS?