

Name: Yash Meshram

Roll No.: 18110192

Course: ME 639 - Introduction to Robotics

### Assignment-1

2. Identify one or two examples of robots for each of the seven categories of robots mentioned in class. Submit your examples as a list of youtube links with 2-3 line explanations for each.

Answer:

- Manipulators
  - SCARA:
    - [High Speed SCARA Robot for Pick & Place – FANUC's New SR-3iA ...](#)
      - 4 degree of freedom with 3 rotation and 1 prismatic joint (3R1P)
      - Pick and Place and assembly with high speed and accuracy and flexibility
  - Candarm: [Canadarm & End Effector with Dee](#)
    - Arm of the shuttle, picking things up and putting things down, and moving them into position.
    - Object should have pin systems on it in order to hold it.
    - 6 degree of freedom
- Mobile robots
  - Unmanned robot:
    - [SEIT - Autonomous Mobile Robots for All Material Handling Needs](#)
      - Production companies for transportation
      - Can be automated or controlled
  - Humanoid robot:
    - Can be programmed to perform the specific task only and can also apply Reinforcement learning(learn from experience)
    - Userfriendly. Can also be used as a assistant in hotels or in an army.
- Aerial robot
  - Drones: [DJI - Introducing DJI FPV](#)
    - Used for photoshooting or video making from the are where it is difficult for humans to go.
    - Can also be used for scanning the building, for spying and for delivery (ex: food delivery)
    - Have 6 degree of freedom.

- Aeroplane
  - Used for transportation
- Underwater robot
  - Autonomous ship:
    - ▶ Automated Cargo Ships: The Next Transport Revolution?
      - Driverless ship just like the driverless car
      - Can be automated or controlled manually
  - Deep Driver:
    - ▶ The deep ocean is the final frontier on planet Earth | The Economist
      - Used to explore the depths of sea
      - Can go in the depths where human can't reach.
      - Can be controlled manually or automated.
- Soft robot
  - Wearable robot: ▶ Soft Robotic Glove
    - This types of robots is very useful for the patients with pyhsical inability
    - Does not put strain onthe user
    - Have 6 degree of freedom
  - Robotic Muscles: ▶ Scientists Develop Super Strong Artificial Muscles
    - Durable than natural muscle
    - Can lift upto 1,000 times of ther own weight
- Micro robot: ▶ 10 Incredible Micro-Robots
  - Magetically actuated mini robot
    - Use magnetic force for the function
    - Can be used in space where gravity is zero
  - Micro scallops
    - Used to supply medicine in a particular part of the body
    - CAn also used to control teh blood flow and blood presssure in body

3. Review the most common types of motors and summarize them with a 2-3 sentence description of each of them.

Answer:

- AC motors : This motor run on Alternating current (AC). It further divided into 2 categories: Synchronous motor and Asynchronous motor.
- DC motors This motor runs in Direct current (DC). Brushed and Brushless motors are DC motors.

- Synchronous motor: Rotation speed of the shaft is equal to the frequency of supplied AC current.
- Asynchronous motor: Also called as induction motor. Speed of its shaft is less than the synchronous speed.
- Brushed motor: It have brushed in the internal part. Its speed can be controls by controlling the voltage.
- Brushless Motor: Used in aerial robots where the speed of the shaft should be high as possible.
- Stepper motor: Usually used when high accuracy is required (for ex: in CNC machines stepper motor are used to control the motions in x,y and z axis)
- Servo motor: It rotates by a fixed angle only.