

Basic of Robotics Session 23





Topics covered & Learning Outcomes

Topics Covered

- 1.What is a robot?
- 2.Advantages of robots
- 3.Applications of robots
- **4.Various Robotics Configurations**

Learning Outcomes

1.Construct a robot that can move.

2.Gain an understanding of the Robotics projects developed.











All About Robots







www.ai.thestempedia.com



All About Robot

Robotics, design, construction, and use of machines (robots) to perform tasks done traditionally by human beings. Robots are widely used in such industries as automobile manufacture to perform simple repetitive tasks, and in industries where work must be performed in environments hazardous to humans.

- In other words, a robot is a machine that is programmed to make de ulletcisions and perform tasks. For example, a screwdriver is a machine t hat can fasten a screw and reduce human effort, but it is not a robo
- However, if it is combined with a robotic arm, then the entire device ulletcan be referred to as a robot.









All About Robot

A robot can be controlled by humans, either directly, or remotely, from a place far away.

- Robot can take decisions, and work entirely on its own; such robots are \bullet called *autonomous robots*.
- There also exist robots that can move from one place to another; they are ulletknown as *mobile robots*.









Advantages of Robots







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Advantages of Robot

- Robots never tire. They can work at the same sp eed with the same consistency without any breaks or holidays.
- They are useful when you need to perform a particular task, such as bottling cans or painting cars over and over again without getting bored. This enables us to utilize our full potential in tasks that can only be done by humans.
- Robots are fast, enabling them to accomplish a g reat deal in a short period of time, thus saving ti me.
- Robots' ability to complete more tasks in a short er period of time leads to an increase in product ivity.
- Robots can be employed to carry out tasks that would be too risky for a human to attempt, as w ell as working in hazardous conditions without t he risk of harm.
- Robots are capable of executing tasks with more precision and excellence than humans.







Application of Robot

Most of the tasks robots are assigned to do are often hazardous, laborious, or unpleasan t; however, this is not always the case. Nowadays, robots can compose music, create art work, and even play soccer! You can be sure that the robots you will be constructing will be awesome!

In reality, robots have become an integral part of modern life and have countless applica tions, some of which are listed below:

• Manufacturing:

Robots are employed for transporting materials from one area to another, as well as f or activities like painting, fabrication, welding, and so on.





Application of Robot

- Space: Exploring outer space, such as with the Curiosity Rover
- Hospital: Surgical robots, réhabilitation robots, pharmacies robots, etc.
- Agricultural: Robots are being created to do jobs like harvesting vegetables and fruits.
- **Military** :Technology such as bomb disposal robots and drone exploration is being utilized.
- Households: For cooking, cleaning, and washing purposes.
 Entertainment: Humanoids, robot dogs, mobile phones, computers, etc. E.g. Aibo the robot dog.
 Transport: Robotics help logistics and shipping companies to deliver goods quickly and efficiently.
- Industrialrobots: A robot designed for industrial use is one that has been create d to carry out labor intensive tasks, such as those needed for a production line that is constantly in motion.





Activity:Make your Robot Move







Activity: Make your Robot Move

- Select the Board as **Quarky**. Next, select the **Serial port** to connect Quarky and press **Connect**.
- Now, select the Tobi.py file from the Project Files section and by default, the syntax will be written in sprite as an object.
- We would be using Quarky in this activity, so we would also be writing \bullet quarky-related functions and for writing those functions we need to define an object for quarky in the same manner as we did for the sprite.
- We need to use time module in python. As we want to have a certain time ulletgap between the display of two emotions on quarky. Python time module allows to work with time in Python. So before starting with this module we need to import it.
- Now, we will be writing the while loop by providing the condition as **while** lacksquare**True**, this implies that the loop should keep on executing until the given boolean condition is evaluated to False. If we write while True then the loop will run forever.



Robot in Forward & Backward Direction

- Now we want our Quarky to move its left wheel in the forward **direction** with a speed of 50%.
- Now, for adding a time **delay** of 1 second after forward motion, we will be using **time.sleep()** function.
- To stop the left motor, we will be using the following function.
- Again, a **delay** of 0.5 seconds is added after completing the forward motion.
- Now, our **complete**, function would look like this
- Similarly, we have to define a function for **backward** direction of left wheel

sprite = Sprite('Tobi') quarky = Quarky() import time while True: time.sleep(1) time.sleep(0.5)

time.sleep(1) quarky.stopmotor("L") time.sleep(0.5)



```
quarky.runmotor("L", "FORWARD", 50)
quarky.stopmotor("L")
```

```
quarky.runmotor("L", "BACKWARD", 50)
```



Robot in Left & Right Direction

sprite = Sprite('Tobi') quarky = Quarky()

import time S = 50T = 0.5while True: quarky.runmotor("L", "FORWARD", S) time.sleep(T) quarky.stopmotor("L") quarky.runmotor("R", "FORWARD", S) time.sleep(T) quarky.stopmotor("R")





Robot Motion Left & Right

Robot Motion Left & Right

Making Quarky to Crawl

```
sprite = Sprite('Tobi')
quarky = Quarky()
```

import time while True: quarky.runmotor("L", "FORWARD", 50) time.sleep(1) quarky.stopmotor("L")

quarky.runmotor("R", "FORWARD", 50) time.sleep(1) quarky.stopmotor("R")





Robot Crawling Motion





