ROBOTICS AND AUTOMATION

Robotics: is a branch of engineering that involves the conception,design,manufacture and operation of robots.

The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways.

Automation: the technique of making an apparatus,process or system work or operate automatically with minimal human input.

Research 3 things or processes that can be automated

Invoicing, sales orders accounting

Reconciliation, data entry,system queries,payroll,employee

Or vendor on- boarding or staff terminations

Robotics combines the use

Electronics Design

Mechanics Construction

* Software Operation

User robots

To program robots to do particular jobs repetitive, dangerous tasks

Benefits of robotics

Improved productivity: robots do not get tired

Increased accuracy of production: reduced human error

Increased speed of production.

Increased safety of production: sharp objects,heavy machinery and high temperatures

Key Concepts and Components af Robotics Technology

The key components and concepts of robotics technology include.

1.Hardware Components: The physical components that make up a robot, such as sensors ,actuators ,manipulators and controllers.

2.Software Components: The programming that controls a robot, including the Operating system,middleware and application software.

3.Sensing and Perception: The ability of a robot to sense its environment through sensor such as cameras, lidar,and sonar and to Interpret that information to make decisions.

4.Control and Planning: The algorithms and techniques used to control the movement of a robot,plan its actions and optimize its performance

5.Human-Robot interaction:The design and implementation of interfaces and interaction channels that enable humans to communicate with and control robots

6.Artificial Intelligence and Machine learning: The use of machine learning and other all techniques to enable robots to learn and adapt to new situations.

7.Three laws of Robotics

First law: a robot cannot harm a human being or remaining passive,leave this human being exposed to danger

Second law: a robot must obey the orders the given by human beings unless such orders contradict the first law

Third law: a robot must protect its own existence to the extent that this protection is not in contradiction with the first or the second law.

8.Safety and reliability: the design and implementation of safety features and redundancy to ensure that robots operate reliably and do not pose a danger to humans.

9.Ethics and societal impact: the consideration of ethical and societal issues related to the use of robots, such as privacy,security,job displacement,and the impact on society as a whole.

INTRODUCTION

Sensors, Detectors and Transducers

A sensor/Detectors /transducers are electrical, optic- electrical or electronic devices composed of speciality electronics or other wise sensitive materials for determining if there is a presence of a particular entity or function.

Analog and Digital

Analog signal: is a voltage,current or physical quantity that continuously and infinitely variesin accordance with some time varying parameter

Digital signal: is a signal that represents data as a sequence of discrete values.

IoT

The term IoT refers to a system ofd computiong devices in the physical world which have been connected to the internet

These devices can either send or receive data from the internet

Components of IoT

Sensors

Connectivity: Wi-Fi (iom),Bluetooth(4 meters)(cellular communication)

People of processes

People of Processes

Customer relationship & support

Analytics & cloud/API

Upgrades & Configurations

Remote monitoring/maintainance

Control & automation

Supply chain management

Security/Energy

Mobile devices & app

Location & Tracking

Financial

Architectures IoT

Things Local Network

Serious & actuators area collection

Procesing like ,PAN ,LAN building

Communication The internet

Network worldwide system

End of user Devices People,processes desktop laptop computer.

Resistor: regulate current