

# **INTRODUCTION TO ROBOTICS**

# LECTURE 1

#### TEXTBOOK

Modern Robotics: Mechanics, Planning, and Control by <u>Kevin M. Lynch</u> (Author), <u>Frank C.</u> <u>Park</u> (Author)



In this course we are going to cover the fundamental knowledge that will continue to be in use now, twenty years ago and twenty years later.

They are the basics and the fundamental concepts that are going to be valid even when the technology going to be changed dramatically. So wish you enjoy the journey of this course



► What is a ROBOT?

► What is ROBOTICS?

► Why we use ROBOTS?

What is a Typical Robotic System ?

### WHAT IS A ROBOT?

► Robot >> Czech word "ROBOTA"

Robota = forced , Slave laborer

► Karel Capek drama 1921.

► ISO and RIA:

Programmable machine.

Perform tasks according to its program.

Deals with issues related to robot

 >> design, manufacturing, programming ..ect.
> Robotics = Mech. Eng + Elect. Eng. + Electronic Eng, -Computer Science .. So on

### WHY USE ROBOTS?

Dynamic competitive markets >> MONEY!

Modern manufacturing methods:

► Reduce production cost.

► Increase productivity.

AUTOMATION

► Improve product quality.

1. Surgical Assistants >> assist surgeons with performing minimally invasive

procedures.



2. Rehabilitation Robots >> recovery of people with disabilities, including

improved mobility, strength, coordination, and quality of life.



3. Medical Transportation Robots >> Supplies, medications, and meals.



#### 4. UV - Bacteria killing robots.



## WHAT IS TYPICAL ROBOTIC SYSTEM CONSISTS OF?

#### **Robotic Arm = Manipulator**

- ► Base
- Links & Joints
- End Effector (Gripper)
- ► Wrist
- Drive (Actuator)
- ► Controller
- ► Sensors





- https://www.asme.org/topics-resources/content/top-6-robotic-applications-inmedicine
- <u>https://interestingengineering.com/uv-bacteria-killing-robot-cleans-hospital-rooms-far-better-than-humans</u>
- <u>https://www.swisslog-healthcare.com/en-gb/products-and-services/transport-automation/relay-autonomous-service-robot</u>
- <u>https://www.robotics.org/blog-article.cfm/Robotics-in-Human-Rehabilitation/16</u>