
# Introduction to Robotics
# CSE 461

Lecture 1: Chapter 1(Introduction to robotics: basics)

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# Marks Distribution

- Quizzes/Class Tests: **15%**
- Assignment and surprise test: **5%**
- Attendance **: 5%**
- Mid Term Examination: **20%**
- Final Examination: **30%**
- Lab: **15%**
- Project: **10%**
- Total: **100%**

# Syllabus

| Chapter | Description | Class |
|---|---|---|
| **1 . Robotics Basics** | Definition of Robot, Robotics, Roboticity, Autonomy, Laws of Robotics, Types of robots, Paradigms, Subsystem | **1 - 4** |
| **2 . Introduction to Industrial Arm** | Manipulator Types, Forward Kinematics, Inverse Kinematics | **5 - 8** |
| **3 . Control System** | Types of Control, Block diagram solving, PID control, Fuzzy Logic Control | **9 - 12** |
| **4. Robot Navigation** | Path Planning, Localization, Mapping, Exploration | **13 - 14** |
| **5 . Robot Learning** | Machine Learning<br>Reinforcement Learning<br>Computer Vision | **15 - 18** |

# What is a robot?

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An embodied agent that can be programmed to perform physical tasks.

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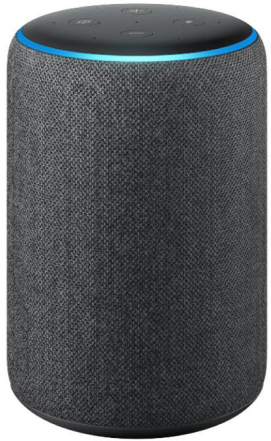


# Degrees of *roboticity*?

An embodied agent that can be programmed to perform physical tasks

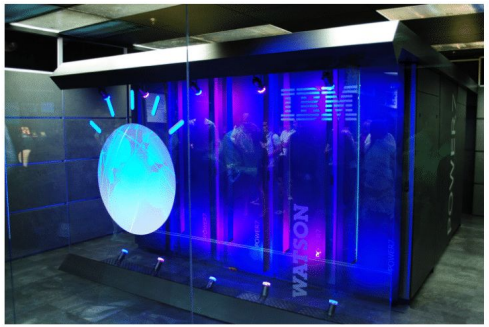
- Lack of universally acceptable definition hints at some deep philosophical questions
- Could also be an indicator of the youth of the field
- Probably need to measure degree of "*roboticity*"
  - In terms of degree of embodiment, autonomy, complexity, programmability, …
  - But we don't have formal definitions for these concepts

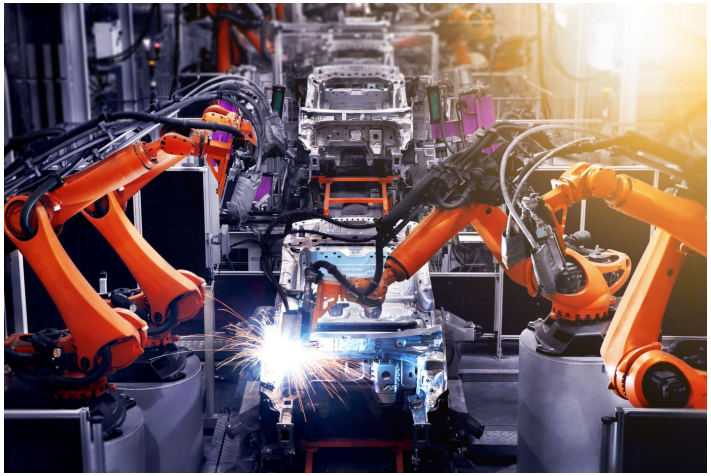
# Robotics

Robotics is a branch of engineering and computer science that deals with the design, construction, operation, and use of robots.

# Robotics vs. Artificial Intelligence

- This is something most roboticists agree on
  - A robot needs to be embodied
  - Artificial Intelligence (AI) need not be embodied



https://www.ubs.com/global/en/investment-bank/in-focus/research-focus/china-360/2020/warehouse-robotics.html

# How Robots Are Used Across Industries

- Industrial
- Farming and Agriculture
- Healthcare
- Logistics
- Family Robots

# Think of some features for your own family robot !

https://www.youtube.com/watch?v=-e1_QhJ1EhQ

# Next Class

- Laws of Robotics
- Primitives
- Paradigms

Thank You