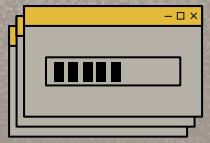
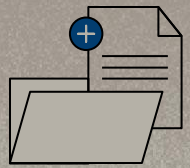


Engineering club

Robotics
Member presentation



Anil, Ayan, Hao

Drafting & CAD Technology

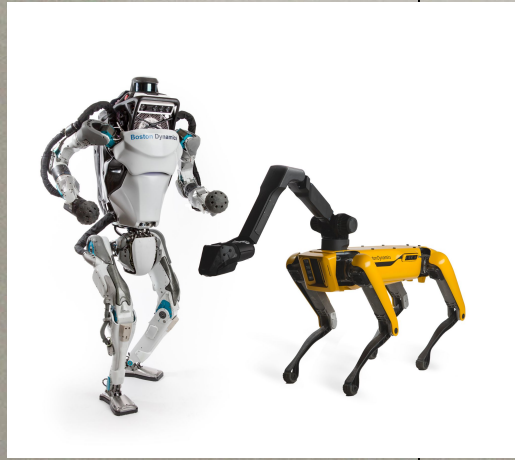
Major for college

01

What is ROBOTICS?

What is Robotics?

- Robotics: branch of engineering involving design, construction, operation, use of robots.
- Machines programmed to perform tasks autonomously or with guidance
- History: first known automata developed by ancient Greeks (automated looms/water clocks). Modern robotics 1950s: first industrial robot by George Devol and Joseph Engelberger. New technologies and applications emerging every year.



Drafting & CAD Technology

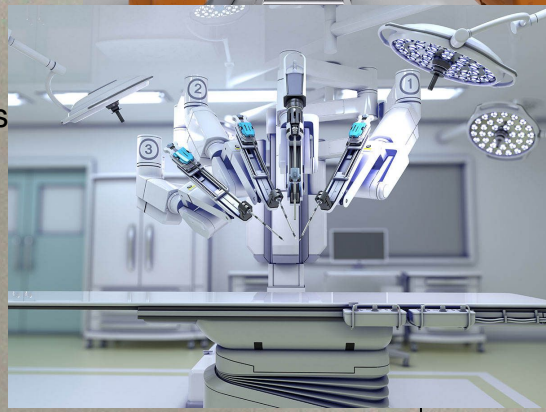
Major for college

02

Types of ROBOTS

Types of robots

- **Industrial robots**:
  a. manufacturing, assembly, packaging
  b. stationary and programmed to perform repetitive/dangerous tasks with high precision and speed
- **Medical robots:**
  a. assist with surgical procedures, rehabilitation, medical diagnosis
  b. controlled by a surgeon/operate autonomously, perform delicate/complex with high precision and accuracy
- **Service robots:**
  a. interact with humans and perform tasks in domestic or public settings, such as cleaning, cooking, and transportation
  b. typically mobile and equipped with sensors and artificial intelligence to navigate and interact with their environment
- **Entertainment robots:**
  a. entertain and engage with humans,
  b. theme parks, museums, and exhibitions. animatronics, humanoid robots, and interactive displays



Drafting & CAD Technology

Major for college

03

The Standard Components OF A ROBOT

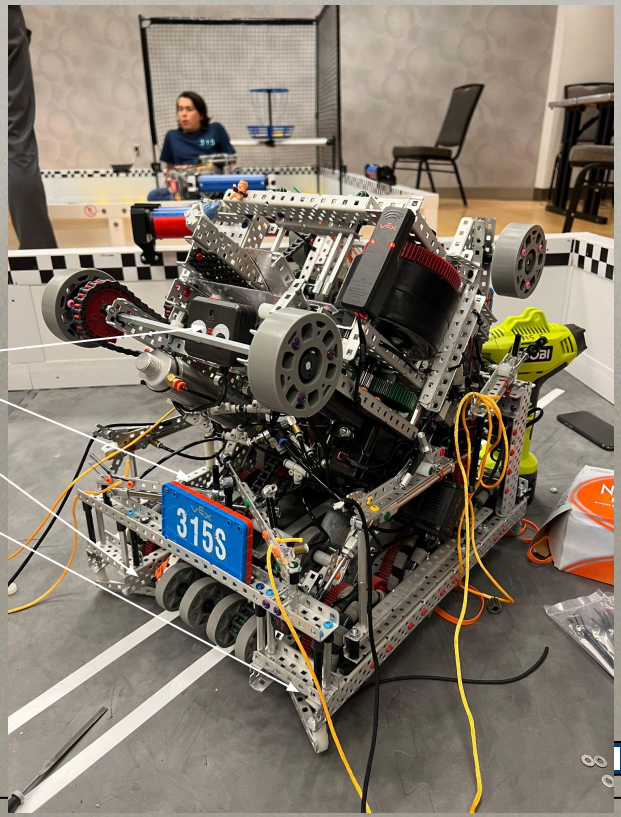
Chassis

Power Source: Battery

Sensors

Sensors:

- Encoders
- Gyro/Inertial
- Ultrasonic
- Camera sensors
- Infrared
- Line trackers



Drafting & CAD Technology

Major for college

04

Robot CONTROL THEORY

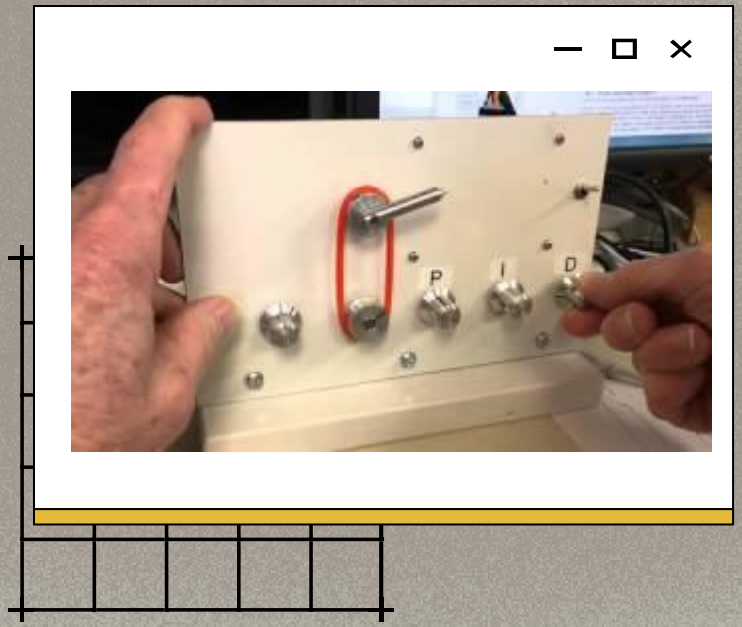
Control Theory Introduction

- What it is: mathematical equations
- Purpose: to achieve precise and stable motion control in robots
- enables robots to adapt to variable environments
- optimize the performance of robots
- challenges :
  a. Works well for well-defined movements but breaks when the reaches the barriers of control
  b. Demands fast refresh for systems to continuously run

Drafting & CAD Technology

Major for college

PID



What **PID** is:

- Precise control of rotational motion systems
  - Wheels
  - Flywheels
  - Rudders
- Math:
  - Proportional
  - Integral
  - Derivative

Drafting & CAD Technology

Major for college

05

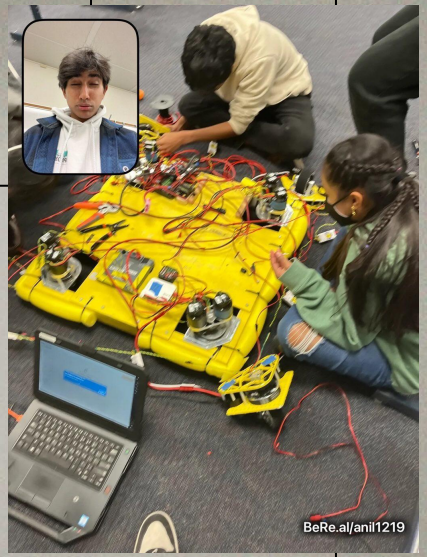
Future of ROBOTICS

What's across the horizon?

- Collaborative Bots
  a. Robots working together with humans in workplaces in order to automate certain tasks
- Artificial Intelligence
  a. Robots “teach” themselves to do certain tasks and mimic human behavior and motion
- Concerns
  a. Robots and AI might get too advanced and go beyond what is intended by humans
  b. May automate and take away too many jobs from humans, causing unemployment

Drafting & CAD Technology

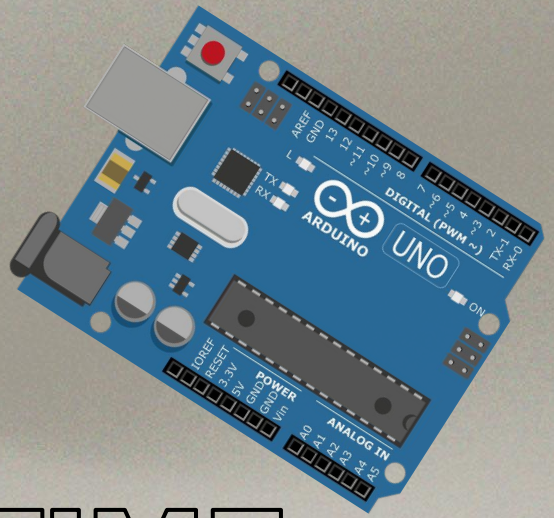
Thank you!



Drafting & CAD Technology

Major for college

06



ACTIVITY TIME