



Course Announcement

The Department of Electrical and Computer Engineering Santa Clara University

ELEN 131 & ELEN 131L: Introduction to Robotics and Lab

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Spring 2022

Class Time: Tu/Th 10:20 am – 12:00 pm;

Lab Time: W 5:00-8:00 pm

COURSE DESCRIPTION: Overview of robotic systems and application areas. Kinematic Analysis of Robotic Manipulators. Joint-space trajectory planning. Linear PID control for manipulators. **LAB:** Laboratory for Robot Programming using Python and Robot Operating System (ROS).



Figure: Examples of robot manipulators cooperating/assisting humans.

BACKGROUND INFORMATION:

In the last decades, robot manipulators are already widely used in industry and manufacturing. In recent years, with the advances in technology, robotic manipulators can collaborate with human co-workers to complete a task, can assist people with disabilities to perform activities of daily living, and can improve our quality of life and work.

In this class, we will learn about robot manipulators and how they operate. We will learn how to solve forward and inverse kinematics for robot manipulators and how to control a robotic manipulator. All these concepts will help us understand the basics of robotics.

In the lab, we will learn how to program a robot by using python a Robot Operating System (ROS). ROS is an open-source robotics middleware suite that is used to program robots. ROS community is growing exponentially and has sky-rocketed. Nowadays, daily new robotics tools, libraries, and packages are being published in ROS by various industries and researchers.

Learning ROS is an excellent opportunity, especially if you are interested to do a senior design project in robotics!

Prerequisite: AMTH 106 (Junior Standing) and Basic Programming