

“MECE 407 Innovative Engineering Analysis and Design” dersini alacak öğrencilerin dikkatine

Bu kapsamda öğrencilerin:

- Tercihen üç kişilik proje grubu oluşturmaları (daha az kişiden oluşan proje grupları komisyonumuzca üç öğrenciye tamamlanabilecektir)

- Grup olarak “Proje Seçme Formunu” (Project Request Form) doldurarak 02 Ekim 2018 günü mesai bitimine kadar bölüm başkanlığı sekreterliğine teslim etmeleri

gerekmektedir.

Aynı projeye birden fazla talep olunması halinde grup üyelerinin Genel Not Ortalaması dikkate alınacaktır. Proje dağıtım sonuçları 5 Ekim 2018 Cuma günü akşamı ilan edilecektir.

2018 - 2019 FALL SEMESTER

MECE 407 INNOVATIVE ENGINEERING ANALYSIS AND DESIGN PROJECT TOPICS

1- Title of the Project: Design and implementation of an Elevator System

Abstract: In this project our aim is implementing a small model of an Elevator system by using mechatronic technology which can be used for education purposes in Laboratories. Mechanical design will be coupled by an electronic circuit to control the motion of Cabin between the floors. Elevator has to mimic real world usage of an Elevator in a building.

Technical specifications of the Project outcome:

Simple electronic components and chips such as PIC 16F84 will be used for control operation of elevator. Mechanical parts will be used to construct the main body of the elevator. A microprocessor such as Arduino will be used to process data with C programming language.

2- Title of the Project: Development of a micro machining laser cutter

Abstract: In this project our aim is implementing a laser cutter for micro machining applications. This gadget will exhibit some attributes such as portability, compactness and re-configurability based on optical design. A programmable spatial Light Modulator (SLM) will be used to manipulate the collimated light. This structured light then will be directed onto a sample by a relay optical system for cutting operation.

Technical specifications of the Project outcome:

Transmitter and receiver units will include different types of LED's and/or laser diodes, lenses, mirrors and collimation units. SLM will be coupled to this designed optical system. Optical detectors such as CMOS or CCD will be used to collect information for real time molding operation. All operations (post processing, molding, drilling, etc.) will be controlled by a Labview Programming Language.

3- Title of the Project: Humanoid Robot Head Design

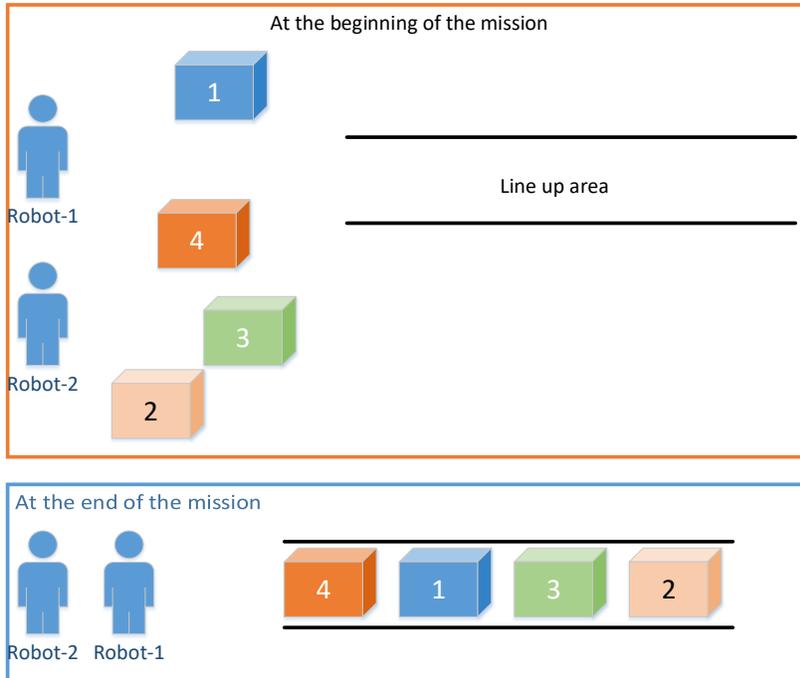
In this project, it is aimed to develop a robot head to interact with humans. As human communication is based on facial expressions and gestures, robot must mimic head moves and emotional states of a human. Robot head will be composed of mechanical parts functioning as eyebrows, eyes, eyelids, lips and a moveable jaw joint. Robot head will be mounted on a fixed base while neck of robot will be composed of several actuators allowing to track a moving human and do head gestures such as nodding meaning yes or no. Eyes of the robot will be ordinary cameras and used to track a human face and analyze his/her facial expression. In addition to this, robot will have microphones in its ears to listen voice commands. Analyzing facial expression and voice commands, robot will interact human subject by producing facial expressions and gestures, and speaking basic words using a loudspeaker under its lips.

4- Title of the Project: Put the boxes in predefined order using multiple autonomous robots.

Design and build multiple autonomous robots to put the boxes in predefined order.

- Order of the boxes will be defined before the mission, therefore there should be a device to set the order of boxes and send command of order to robots.
- Robots should communicate with each other.
- Robots must work collaboratively to line up boxes.
- Robots should push (or pull) boxes to the row in predefined order.
- Robots should operate fully autonomously,
- There should be no hard wired connection between robots and control center.
- The robots should not be collided with each other.

Properties of the robots, boxes and the field will be determined with the students taking the project.



5- Title of the Project: Construction and Development of a Light Tracker Device

A device that tracks light or colored object (a ping-pong ball). The device should at least make 2 rotary movements and when the light or colored object moves into a very close location with the device. It is forbidden to use any camera system for the tracking purpose

6- Title of the Project: Design, Manufacture and Implementation of a Mini Size Tension Test Equipment

- max force 500 kg,
- hydraulic or trapezoidal thread actuated,
- on-line force measurement with stain gages or load cells,
- on-line displacement measurement,
- all data should be transfered on-line to a computer,
- on-line plot of the engineering stress. vs. strain variation,
- necessary programmes (embedded or the ones to be run at the computer side) should be prepared to calculate stress, strain, deflection, area change of the specimen
- all the necessary sensors and the actuators will be selected and mounted by the project members
- thread actuated power system equipped with gear box(es) could be used for the sake of simplicity and economy,

-tension tests should be performed using small size/diameter samples made of steel, copper, polimer and composites.

7- Title of the Project: Dancing Drones

Problem Statement

Design and build two identical quadcopters which will be in formation with music.

- Two identical quadcopters should be designed.
- Vehicles should communicate with each other.
- Vehicles should take a preprogrammed formations according to music.
- Vehicles should operate fully autonomously,
- There should be no hard wired connection between vehicles and control computer.
- The vehicles should not be collided with each other.

Properties of the vehicles, and the formations will be determined with the students taking the project.