MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 Project Proposal

Asst. Prof. Dr. Candeniz SEÇKİN

Title

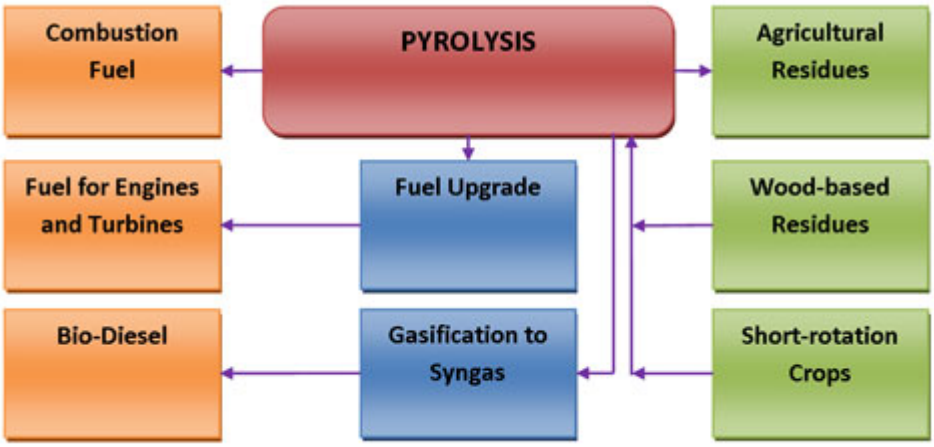
EEA analysis of fuel production and power generation processes via fast prolysis method

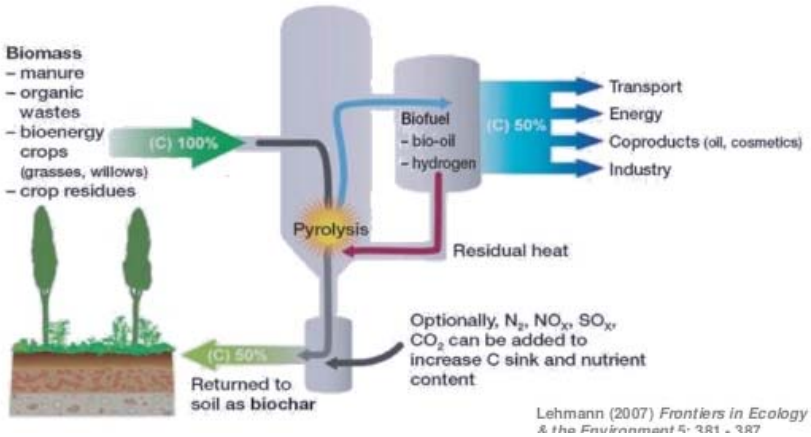
Abstract

"Pyrolysis" is a method in which thermal waste treatment is taken place in an oxygen free environment. There are three types of pyrolysis methods which are: conventional pyrolysis (550–900K), fast pyrolysis (850–1250K), and flash pyrolysis (1050–1300K) [1,2]. The products of biomass pyrolysis include biochar, bio-oil and gases including methane, hydrogen, carbon monoxide, and carbon dioxide. Depending on the thermal environment and the final temperature, pyrolysis will yield mainly biochar at low temperatures, less than 450 C, when the heating rate is quite slow, and mainly gases at high temperatures, greater than 800 C, with rapid heating rates. At an intermediate temperature and under relatively high heating rates, the main product is bio-oil. All of these are possible energy sources of different power generation processes [3].

Extended Exergy Accounting (EEA) includes the "extended exergy balance" of all material, energy carriers and also immaterial/non-energetic production factors (externalities) and provides a good measure of resource which are irreversibly consumed in the life cycle of a material or immaterial commodity. Thus, the global problem of resource depletion and environment damage can be monitored by EEA, which is in essence a carefully and rigorously defined extension not of the concept of exergy but of its application to measure different fluxes. Once the numeraire of *extended exergy* (which is a strictly thermodynamic quantity that expresses the amount of equivalent primary exergy "embodied" in a commodity) is employed as the sole measure of resource consumption, it automatically follows with minimization of exergy use and destruction which are essential for improving the degree of sustainability [4].

This project focuses on the EEA analysis of energy generation process from municipal solid waste by means of fast prolysis methodology.





Related Information

[1]http://www.seas.columbia.edu/earth/wtert/sofos/nawtec/nawtec18/nawtec18-3559.pdf

[2] http://www.altenergymag.com/content.php?issue_number=09.02.01&article=pyrolysis

[3] Alperen Tozlu, Emrah Özahi, Ayşegül Abuşoğlu. Waste to energy technologies for municipal solid waste management in Gaziantep. Renewable and Sustainable Energy Reviews, **54,** (2016), 809–815

[4] Enrico Sciubba. From Engineering Economics to Extended Exergy Accounting: A Possible Path from Monetary to Resource-Based Costing, Journal of Industrial Ecology, **8**, (2004), 19–40.

Number of Students-

2 students

Required Qualifications

Student should know EES (or MUST BE STRONGLY willing to learn – it takes time) + Microsoft Excel.

Prerequisite Courses

Thermodynamics I, Thermodynamics II

Fulfilled Graduation Project Criteria

Determination of EEA quantity for the considered pyrolysis based municipal solid waste treatment process

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 Project Proposal

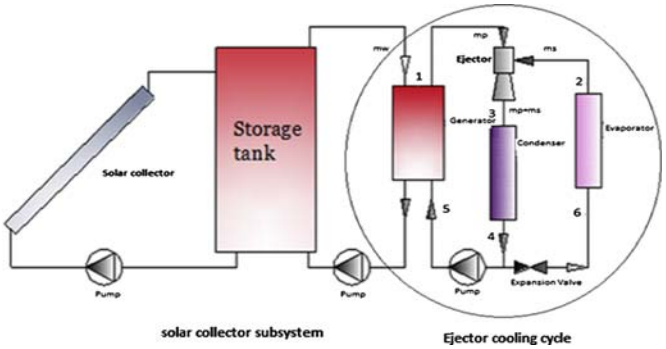
Asst. Prof. Dr. Candeniz SEÇKİN

Title

Design of a solar assisted ejector air-conditioning system and performance analysis

Abstract

The purpose of incorporating an ejector into vapour compression cycle is to improve the COP by reducing the throttling loss associated with the expansion device. Computer simulation of the ejector cycle must be carried out using a one-dimensional model based on mass, momentum and energy balances. Stages of this present project are: 1) computation of solar radiation (flat plate, inclined, evacuated tube collector), 2) simulation of storage tank, ejector and the whole air conditioning system, 3) analysing the performance.



Related Information

http://www.your-solar-energy-home.com/Solar-ejector-cooling.html
http://file.scirp.org/Html/1-2320023_22535.htm
https://www.youtube.com/watch?v=MrmtmWSt5Og&index=2&list=PLXWKbwjLpAopyQ63g1D-ioe2GZcTBhwx8
Hourly dynamic simulation of solar ejector cooling system using TRNSYS for Jordanian climate, Energy Conversion and Management 100 (2015) 288–299

Number of Students-

3 – 4 students

Required Qualifications

Student should know EES (or MUST BE STRONGLY willing to learn – it takes time). Additionally, one of the MATLAB or TRNSYS is needed for solar radiation computations.

Prerequisite Courses

Thermodynamics I, Thermodynamics II, Fluid mechanics, Heat transfer, Numerical methods

Fulfilled Graduation Project Criteria

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 Project Proposal 1

Dr. Barış YILMAZ

Title

Design of an experimental set up to measure the conductivity of nano-particle doped ferro fluids under magnetic field.

Abstract

In this project, students will design an experimental set up to measure conductivity of ferro fluids under magnetic field. Effect of nano particle doping will be also studied .

Number of Students-

2 students in a group may apply for this project.

Required Qualifications

Student should have well knowledge of Thermodynamics, Heat transfer and Fluid mechanics.

Prerequisite Courses

Should have passed ME263-ME264 Thermodynamics 1&2, ME361 Fluid Mechanics and ME371 Heat Transfer courses. It's preferable that students have registered to ME474 HVAC System Design course that will opened in 2016 Fall semester.

Fulfilled Graduation Project Criteria

Criteria 1-4,6&8 are expected to be satisfied by the project.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 Project Proposal 3

Dr. Barış YILMAZ

Title

Thermo electric system utilisation to increase the system efficiency in heating or cooling applications.

Abstract

Thermo-electric components are considered in several applications in order to increase the system efficiency by utilization of the waste heat. Besides the thermo-electric plates, the heat removal components utilized for the heat transfer from the surface should be examined in detail. In this project study students will be motivated to perform both numerical and experimental studies.

Related Information

www.sciendirect.com may be visited for articles related to the topic.

Number of Students-

Students in a group of 2 or 3 may apply for this project.

Required Qualifications

Students should have knowledge of analysis programs preferably Fluent or Comsol. Having well background of Heat transfer and fluid mechanics is requied.

Prerequisite Courses

Should have passed ME263-ME264 Thermodynamics 1&2, ME361 Fluid Mechanics and ME371 Heat Transfer courses.

Fulfilled Graduation Project Criteria

Criteria 1-4,6&8 are expected to be satisfied by the project.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 Project Proposal 3

Dr. Barış YILMAZ

Title

Thermo electric system utilisation to increase the system efficiency in heating or cooling applications.

Abstract

Thermo-electric components are considered in several applications in order to increase the system efficiency by utilization of the waste heat. Besides the thermo-electric plates, the heat removal components utilized for the heat transfer from the surface should be examined in detail. In this project study students will be motivated to perform both numerical and experimental studies.

Related Information

www.sciendirect.com may be visited for articles related to the topic.

Number of Students-

Students in a group of 2 or 3 may apply for this project.

Required Qualifications

Students should have knowledge of analysis programs preferably Fluent or Comsol. Having well background of Heat transfer and fluid mechanics is requied.

Prerequisite Courses

Should have passed ME263-ME264 Thermodynamics 1&2, ME361 Fluid Mechanics and ME371 Heat Transfer courses.

Fulfilled Graduation Project Criteria

Criteria 1-4,6&8 are expected to be satisfied by the project.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Assoc. Prof. Dr. Emre Alpman

Title

Design of a Wind Augmentation System for a Vertical Axis Wind Turbine

Summary

Despite their advantages, vertical axis wind turbines are known to have a self-starting problem and they may operate poorly in low wind situations. In this project the students are going to design and optimize a passive wind augmentation system.

Number of Students-

2

Required Qualifications

Students should have sufficient experience using in programming and should be eager to work with software in Linux environment.

Prerequisite Courses

Should have passed CSE 1121 Scientific Programming and ME 3061 Fluid Mechanics courses.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 2

Assoc. Prof. Dr. Emre Alpman

Title

Marine propeller design including cavitation effects.

Summary

Propellers are the most widely used devices for propulsion in marine transport systems. Therefore, their design is very important to provide thrust at minimum possible fuel consumption. However, some of the measures taken to improve the performance of a marine propeller might increase cavitation which is not desirable. In this project the students will design a marine propeller for optimum thrust performance while keeping the risk of cavitation at minimum.

Number of Students-

2

Required Qualifications

Students should have sufficient experience using in programming and should be eager to work with software in Linux environment.

Prerequisite Courses

Should have passed CSE 1121 Scientific Programming and ME 3061 Fluid Mechanics courses.

Mühendislik Fakültesi

2018/2019 Fall ME 4097 Project Proposal 1 Asst. Prof. Emrecan Soylemez

Cost Effective High Quality Coffee Grinder

Abstract

Freshly brewed coffee amplifies the richness of the flavor in the coffee. Storing the roasted coffee beans without grinding is the only easy way to have the fresh coffee when it is needed. Therefore, coffee grinders are in huge demand in recent years. There are two types of grinders, blade and burr grinders. Burr grinder performs better because it does not overheat the coffee beans during the process. Their cost on the other hand is higher compared to blade type og grinders. This project will transform a manual *Sozen* grinders into an automatic grinder at a low cost.

2 Students for this project are required.

Qualifications
- Key candidates should know how to use a CAD software,
- Matlab Simulink knowledge is expected during the project,

Prerequisites
- Engineering Drawing
- Strength of Materials
- System Dynamics and Control
- Machine Design

Fulfilling the Project Criteria by
Criteria 1-4,6&7, and 9&10 are expected to be satisfied by the project.

https://www.delonghi.com/en-us/products/coffee-and-espresso/coffee-makers/grinders/kg89-0177111020

http://www.tarihidegirmencisozen.com/kahve-degirmeni

Mühendislik Fakültesi

2018/2019 Fall ME 4097 Project Proposal 1 Asst. Prof. Emrecan Soylemez

Selective Laser Melting Process Understanding

Abstract

This project will study selective laser melting (SLM) process mapping. Single laser source heat transfer FEA simulations will be conducted. Experimental samples will be analyzed under the optical microscope. After the study, physics of the SLM will be understood and process parameters will be presented to achieve the high quality parts by using the SLM process.

2 Students for this project are required.

Qualifications
- Key candidates should know how to use a CAD software and FEA knowledge is beneficial
- Image processing understanding will be expected

Prerequisites
- Engineering Drawing
- Heat Transfer

Fulfilling the Project Criteria by
Criteria 1-4,6&7, and 9&10 are expected to be satisfied by the project.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097-4098 Project Proposal

Prof. Dr.Erturul TAÇGIN

Title

Designing Alternative Mechanical Systems for Handling Motion Fluctuations of Vehicle Engines

Aim

Motion fluctuations of vehicle engines are traditionally achieved by flywheels with very high inertia compared to the other components that may be one of the largest sized part of an engine. Having understood the underlying theoretical principles of motion fluctuations, much smaller sized mechanical systems may be designed that contain alternative machine components to consume or provide energy from/to the system in the right time. Aim of this project is to study the necessary underlying theoretical principles of motion fluctuations and to produce much smaller sized alternative designs apart from a flywheel in a vehicle engine.

Number of Students-

2

Prerequisite Courses

The courses to be taken ME2003 Dynamics and ME3015 Mechanisms. It's also preferred that the student has taken ME3020 Dynamics of Machines and Mechanisms.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING
2018-2019 ACADEMIC YEAR
ME497 / ME4097 & ME498 / ME4098
ENGINEERING PROJECT I & II

DESIGN AND OPTIMIZATION OF AN ACTIVE SUSPENSION SYSTEM

to be supervised by

ASSOC. PROF. DR. MUSTAFA ÖZDEMİR

Abstract	In this project, it is aimed to optimize an active suspension system for automobiles by considering the ride comfort, rattle space and road holding. The optimal control law will be determined by minimizing an appropriate quadratic performance index. The frequency response functions of the designed active suspension system will also be compared with those of the corresponding passive one.
Number of Students	3 students will participate in the project.
Preferred Qualifications	Having a strong interest in automotive engineering and vehicle dynamics
Prerequisite Courses	1. ME2003 / ME252 Dynamics 2. ME3021 / ME321 System Dynamics and Control
Expected Outcomes of the Project	This project is believed to be a good starting point for students who are interested in a career in the fields of automotive engineering and vehicle dynamics after graduation. This aim can be achieved by • constructing the active quarter car model (*in conjunction with the Program Outcomes #1 and #2 of our Department*), • studying the design and optimization of the active suspension system (*in conjunction with the Program Outcome #3 of our Department*), • making use of computer assistance where applicable (*in conjunction with the Program Outcome #4 of our Department*), • improving your personal creativity in a team environment while being strictly adhered to professional and ethical standards (*in conjunction with the Program Outcomes #6 and 9 of our Department*), • writing project reports and presenting your results in a final oral presentation (*in conjunction with the Program Outcome #7 of our Department*), • improving your project management skills (*in conjunction with the Program Outcome #10 of our Department*).
References	1. Tseng, H. E., & Hrovat, D. (2015). State of the art survey: active and semi-active suspension control. *Vehicle System Dynamics*, 53(7), 1034-1062. 2. Jazar R. N., Vehicle Dynamics: Theory and Application, 2nd Edition, Springer, 2014. 3. Zaremba, A., Hampo, R., & Hrovat, D. (1997). Optimal active suspension design using constrained optimization. *Journal of Sound and Vibration*, 207(3), 351-364.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 ME 4097/4098 Project Proposal 1

Asst. Prof. Dr. Mehmed Rafet Özdemir

Title
Design and Development of Liquid Cooled Micro Heat Exchanger

Summary
Recent advances in the industry brought smaller devices into the market. These fast, compact devices have higher cooling loads compared to their old rivals. Therefore, micro heat exchangers have become quite common in many applications such as electronics cooling and microturbine cooling. Students will design and develop a liquid-cooled micro heat exchanger for a graphics card of a high tech laptop.

Number of Students-
Max: 3, Min:2

Required Qualifications
Students should complete Heat Transfer course successfully (grade CB or higher). They should also have practical experience in using Fluent or Comsol programs.

Prerequisite Courses
Should have passed ME3071 Heat Transfer, ME3061 Fluid Mechanics, ME3031 Machine Design 1, ME2063 Thermodynamics 1. It's preferable that students have taken ME4061 Compressible Fluid Flow.

SÖZ VERİLMİŞ ÖĞRENCİLER
Ahmet ZENGİN 150414052
Furkan DEMİRYUĞURAN 150414036
İlker ÖZSOY 150414020

MARMARA UNIVERSITY FACULTY OF ENGINEERING MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Prof. Dr. Tanay Sıdkı Uyar

Title

Design and Development of 100 % Renewable energy cities in the home towns of the students taking the Project

Summary

Designing a carbon free climate friendly city. The existing energy system of the cities are fuelled by fossil fuels and energy is used inefficiently. The Project will examine the energy system of the city and plan how to transform the city to a zero emission city

Number of Students-

1

Required Qualifications climate friendly, open minded, ready to define problems and find solutions that can be implemented

Prerequisite Courses

MARMARA UNIVERSITY FACULTY OF ENGINEERING MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 2

Prof. Dr. Tanay Sıdkı Uyar

Title

Development of energy, economy and ecology long term strategic energy decision support tool for selected cities of Turkey (the cities of the students taking the project)

Summary

Reference Energy System Design of the cities as a base for the Energy Decision Support Tool of the cities. After collecting the relevant data for the city, long term decision alternatives will be figured out with the scenarios emerging as decarbonization and transformation of the cities requested as soon as possible

Number of Students-

1

Required Qualifications Student should be familier with the computer models and develop scenarios for the future

Prerequisite Courses

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 & ME 498 Project Proposal 2

Prof. Dr. Paşa YAYLA

Title

Designing and Manufacturing of Buckling Test Kit

Abstract

A new laboratory type buckling test kit is to be design, analyzed and manufactured.

Related Information

https://www.gunt.de/en/products/engineering-mechanics-and-engineering-design/strength-of-materials/buckling-and-stability/demonstration-of-euler-buckling/020.12100/wp121/glct-1:pa-148:ca-11:pr-1530

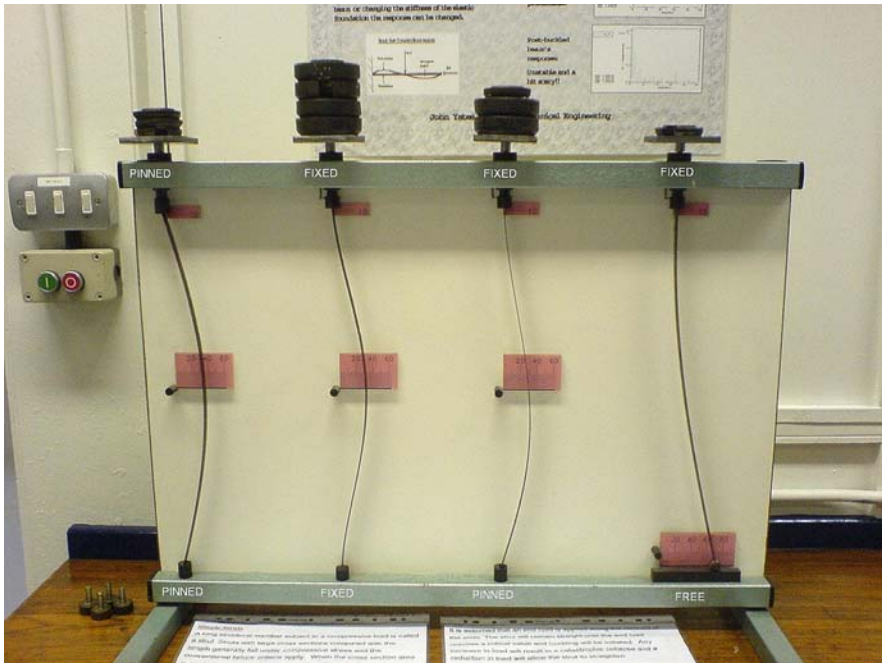
https://www.youtube.com/watch?v=iBYaYCHLtlM

Number of Students-

1- 2 or 3 students are enough for this project.

Required Qualifications

CAD (Solidworks), Solidworks Simulations, ANSYS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MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 497 Project Proposal 1

Prof. Dr. Paşa YAYLA

Title

Designing and Manufacturing of a **Nol Ring** Test Apparatus for Testing Plastic Pipes

Abstract

A new test apparatus for testing plastic pipes is to be design, analyzed, manufactured and tested.

Related Information

- **http://www.wyomingtestfixtures.com/Products/f4.html**
- **http://www.dtic.mil/dtic/tr/fulltext/u2/449719.pdf**
- **ASTM D2290**
- **http://www.sciencedirect.com/science/article/pii/S0308016110002024**
- https://www.youtube.com/watch?v=LUhlt6sfrZA

Number of Students-

1- 2 or 3 students are enough for this project.

Required Qualifications

CAD (Solidworks), Solidworks Simulations, ANSYS

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2017/2018 Fall ME 497 Project Proposal 1

Prof. Dr. Paşa YAYLA

Title

Designing and Manufacturing of Strain-gauge Stress Analysis Test Kit

Abstract

A new laboratory type strain gauge strass analysis test kit analyses is to be design, analyzed and manufactured.

Related Information

http://www.tecquipment.com/Materials-Testing/Stress-Strain/SM1009.aspx
http://www.mutiaranata.com/product/detail/fl-100-strain-gauge-training-system
http://humil.net/engineering/st340-strain-gauges-apparatus
http://www.ti-acad.jo/en/index.php?page=products&productId=356

Number of Students-

1- 2 or 3 students are enough for this project.

Required Qualifications

CAD (Solidworks), Solidworks Simulations, ANSYS

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Dr. İbrahim Sina Kuseyri

Title

Modeling and Stabilization Control of Battle Tank Turret System

Summary

Demands on increasing the battlefield mobility, that is, the ability of tanks to move when in actual or imminent contact with enemy forces, inevitably lead to the requirement of firing on the move, instead of having to stop every time they engage a target. This requirement call, in turn, for gun control systems which minimize the effects of vehicle motion on the main armament of tanks and in particular its ability to hit targets. The effects of vehicle motion on the armament of the tank can be minimized by gun stabilization systems that are designed to maintain the spatial orientation of guns.

Number of Students-

1-2 (Önder Özyurt -)

Required Qualifications

Student should have experience using Matlab/Simulink.

Prerequisite Courses

Should have passed ME3021 System Dynamics and Control, and ME2003 Dynamics.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 2

Dr. İbrahim Sina Kuseyri

Title

Vibration Based Condition Monitoring and Fault Diagnosis of a Gas Turbine

Summary

Maintenance of gas turbines requires advanced monitoring approaches to estimate turbine performance and health in order to increase its life and reduce maintenance costs. We will use support vector machine (SVM) regression approach to monitor a turbine health and condition. Condition monitoring is the process of recognizing when a system has begun to operate outside its original design limits. In fact, the monitoring of vibration parameters can identify abnormality in time, which can effectively avoid fault occurring and reduce maintenance costs. It is often the case that those model-based methods are unavailable or they do not accurately describe the complex system to monitor the turbine. Among the machine learning methods ,SVM indicates its superior ability in solving the regression problem. Therefore, in this work we will develop a data driven method which employs support vector machines to build a gas turbine monitoring model using sets of training and testing data.

Number of Students-

1 (Abdürrahim Yaşa)

Required Qualifications

Student should have experience using Matlab and must be eager to build further skills on 'machine learning'.

Prerequisite Courses

Should have passed ME3021 System Dynamics and Control, and ME3018 Mechanical Vibrations

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 3

Dr. İbrahim Sina Kuseyri

Title

Gyroscopic Stabilization and Control of a Two-Wheeled Vehicle

Summary

The dynamic stabilization of a monorail car or two-wheeled automobile requires that a torque acting on the car from the outside be neutralized by a torque produced within the car by a gyroscope. The gyroscope here is used as an actuator, not a sensor, by using precession forces generated by the gyroscope. When torque is applied to an axis normal to the spin axis, causing the gyroscope to precess, a moment is produced about a third axis, orthogonal to both the torque and spin axes. As the vehicle tilts from vertical, a precession-inducing torque is applied to the gyroscope cage such that the resulting gyroscopic reaction moment will tend to right the vehicle. The key idea is that motion of the gyroscope relative to the body is actively controlled in order to generate a stabilizing moment. The control problem is to roll-stabilize an unstable cart. In the cart design, destabilizing forces are resisted by a gyroscope, which is driven by a motor.

Number of Students-

1 or 2

Required Qualifications

Student should have experience using Matlab/Simulink

Prerequisite Courses

Should have passed ME 2003 Dynamics an ME3021 System Dynamics and Control

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Prof.Dr. Sibel Özdoğan

Title

Thermodynamic Analysis of Trigeneration with Organic Rankine Cycle (ORC)

Summary

The utilization of organic Rankine cycle (ORC) technology is increasing rapidly due to its adaptability to various low-grade heat sources. Several researchers have examined the technological, economic and environmental performances of different trigeneration systems integrated with ORC unit based on different low/medium-temperature heat sources. By coupling the ORC unit to combined cooling, heating and power (CCHP) plant, solar collector and biomass boiler, three systems, namely, CCHP-ORC, Solar-ORC as well as Biomass-ORC can be proposed.

The objective of this work is to investigate at least one solar driven trigeneration system by the energetic point of view. For example parabolic trough collectors coupled to a storage tank can be used in order to feed an ORC which rejects heat to an absorption heat pump. The proposed system is best investigated using both energy and exergy criteria. The sensitivity of the system to parameters such as the heat source temperature in the inlet of the heat recovery system, the pressure in the turbine inlet and the heat rejection temperature of the organic Rankine cycle to the absorption chiller are to be sought. Selected organic fluids are to be examined within this frame.

Number of Students-

2 0r 3

Required Qualifications

Students should have experience using at least EES and preferably Matlab/Simulink. They should also have genuine interest in the up to date developments related to trigeneration such as nw storage systems , in the use of nano-fluids in solar systems etc along with a robust thermodynamics concept.

Prerequisite Courses

Students should have passes both thermodynamics and heat transfer courses, i.e. ME 2063 , ME2064 and ME 3071.

Have a nice summer vacation. See you in Fall 2018☺

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Asst. Prof. Ugur Tumerdem

Title

Comparison and Development of Bilateral Teleoperation Systems in the Presence of Time Delay

Summary

Students will implement state of the art teleoperation algorithms on 2 Phantom Omni haptic interfaces and compare their performance under time delay using various transparency and stability metrics. They will try to find ways of improving these algorithms.

Number of Students-

2- Aziz Cihan Kaya and Fatih Toğuş have been selected to work on this project.

Required Qualifications

Student should have extensive experience using Matlab/Simulink..

Prerequisite Courses

Should have passed ME321 System Dynamics and Control, ME331 Machine Design 1, ME252 Dynamics, ME314 Mechanisms. It's preferable that the student has taken ME418 Introduction to Robotics and ME322 Mechatronics.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Asst. Prof. Ugur Tumerdem

Title

Control System Development for a General Purpose Parallel Wrist Mechanism

Summary

We have developed a 3DOF parallel wrist mechanism that can be used in robotics, haptics and defense applications. We have already built a mechanical prototype and in this project, the student will develop the control system and algorithms for this system to become fully functional.

Number of Students-

1

Required Qualifications

Student should have extensive experience using Matlab/Simulink. Should also have practical experience in electrical/electronics circuits and microcontrollers.

Prerequisite Courses

Should have passed ME321 System Dynamics and Control, ME331 Machine Design 1, ME252 Dynamics, ME314 Mechanisms. It's preferable that the student has taken ME418 Introduction to Robotics and ME322 Mechatronics.

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 1

Assoc. Prof. Dr. Aykut Kentli

Title
Optimization of drilling path using metaheuristic algorithms

Summary
Hole drilling is one of the major basic operations in part manufacturing. It follows without surprise then that the optimization of this process is of great importance when trying to minimize the total financial and environmental cost of part manufacturing. We will use metaheuristic algorithms in optimization.

Number of Students-
2

Required Qualifications
Student should have extensive experience using Matlab/Simulink. Should also have practical experience in coding.

Prerequisite Courses
Should have passed ME313 Manufacturing Processes I

MARMARA UNIVERSITY
FACULTY OF ENGINEERING
MECHANICAL ENGINEERING

2018/2019 Fall ME 4097 Project Proposal 2

Assoc. Prof. Dr. Aykut Kentli

Title
Optimization of drilling path using genetic algorithms

Summary
Hole drilling is one of the major basic operations in part manufacturing. It follows without surprise then that the optimization of this process is of great importance when trying to minimize the total financial and environmental cost of part manufacturing. We will use genetic algorithms in optimization.

Number of Students-
2

Required Qualifications
Student should have extensive experience using Matlab/Simulink. Should also have practical experience in coding.

Prerequisite Courses
Should have passed ME313 Manufacturing Processes I