Anuj Vivek Kankar

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Introduction

I am an undergraduate student in the Department of Metallurgy and Material Engineering at the National Institute of Technology Warangal, one of the prestigious institutes in India. I am interested in Aerospace control and structures and also Robotics and machine learning. I am very passionate to serve in the Rocket industry through research and development in the Future. Looking for a summer internship oppotunity in Structure and Control

Education

Btech in Metallurgy and Material Engineering(4 year course) : Octuber,2020-present

– I am currently in my pre-final year in the Department of Metallurgy and Material Engineering at the National Institute of Technology Warangal, India.The SGPA(semester grade) of my last semester is 7 and my CGPA(cumulative grade) after 2nd year is 6.92 , calculated out of 10.

Skills

Programming language and scripting : Python, MATLAB, raspberry pi,LaTex
Modelling and Simulation : MATLAB & Simulink, Ansys , ABAQUS , Fusion 360.
Software/Platform/Package : MS Word,MS Powerpoint,MS Excel, Jupyter,Tensorflow,Sckit-learn
Additional: Machine learning, Deep learning

Research Experience

Dynamic Inversion on Satellite Attitute Dynamics with Reaction shpere as Actuator

- Implemented Dynamic inversion Nonlinear control on satellite Attitude Dynamics with Reaction sphere as an Actuator
- Designed the Fault Tolerant Controller

Machine Learning on Metamateial

- Predicted deflections of the curved beam with the help of certain parameters, beam is taken as part of Hexagonal metamaterial.
- Prediction models like XG boost, Random Forest, etc are made and results are validated with the help of ABAQUS

Robotic Arm with two DOF

- Designed a Robotic Arm with two DOF on Fusion 360
- Open CV is used to detect objects with help of a camera and move arm according to the information coming from the camera

Sliding mode control on Satellite Attitude Dynamics

- Implemented Sliding mode control on Satellite Attitude Dynamics with Reaction wheels
- Different methods are applied to reduce chattering effect

Cold gas propulsion system

- Developed a prototype model for cold gas thruster

Structure and Thermal Analysis of Rocket Nozzle

- Pressure loads are also applied using isentropic flow relations for a Rocket nozzle
- Pre-stressed harmonic analysis is also done using ansys

Internship

Student Research Associate : May 2022 - July 2022

– Worked under prof Dipak Kumar Giri, SDFC Lab, IIT Kanpur, India

– Implemented different types of Non-linear Controller on Satellite Attitude Dynamics

– Designed a Robotic arm with two DOF for the satellite docking system

Remote Researcher : Nov 2021 - present

– Working under prof Tanmoy mukhoupadhyay, AEMS Lab, IIT Kanpur, India

– Generalized the curved beams equation under shear and axial loads for Honeycomb Non-linear Meta-material with the Help of the Machine Learning models

Courses

Rocket Propulsion
Linear Control
Sliding mode control
Satellite Attitude and Dynamics
Aerospace Structures
Finite Element Method

Position of Responsibility

Joint Secretory : Robotics club NITW

– worked on the design and development of Remote control car

– worked on the analysis of the Quadcopter with Fusion 360

Excecutive Secretory : Satellite club NITW

– Taking workshops for students to increase partication in satellites and Rockets Industry .