A dissertation report on

"Mechanics of Orbit Using Python(MOPy)"

Submitted to

In partial fulfilment of the requirements for the award of degree

Bachelor of Technology
In
Aerospace Engineering

Submitted by:

Ramkiran L.   Manjunath
17030141AE007   17030141AE009
lramkiranBTECH17@ced.alliance.edu.in   manjunathBTECH17@ced.alliance.edu.in

Monisha Patel A.   Thoshitha R. Kumar
17030141AE013   17030141AE027
pamonishaBTECH17@ced.alliance.edu.in   kuthoshithaBTECH17@ced.alliance.edu.in

Under the guidance of
Dr. Gisa G.S.
Assistant Professor
Department of Aerospace Engineering,
Alliance College of Engineering and Design,
Alliance University
Bengaluru.

Department of Aerospace Engineering
Alliance College of Engineering and Design
Alliance University, Bengaluru - 562106
Batch - 2017-21
Year - 2021

CERTIFICATE

This is to certify that **Mr. Ramkiran L. (17030141AE007), Mr. Manjunath (17030141AE009), Ms. Monisha Patel A. (17030141AE012)** and **Ms. Thoshitha R. Kumar (17030141AE027)** students of **Aerospace Engineering, Bachelor of Technology 2017-21** batch at **Alliance College of Engineering and Design (ACED), Alliance University, Bengaluru** has completed the project report titled *"Mechanics of Orbit using Python"* under my guidance in partial fulfillment for the award of Bachelor of Technology degree in Aerospace Engineering, Alliance University, Bangalore during the year 2020-2021.

Dr. Gisa G.S	**Dr. Velmurugarajan K.**
Internal Guide	Head of the Department
Department of Aerospace Engineering	Department of Aerospace Engineering
ACED, Alliance University	ACED, Alliance University
Bengaluru	Bengaluru

Dr. Reeba Korah

Interim Dean
Department of Aerospace Engineering
ACED, Alliance University
Bengaluru

External Viva

Name of Examiners	**Signature with date**
1.	
2.	

DECLARATION

We, Ramkiran L, Manjunath, Monisha Patel A, Thoshitha R. Kumar students of 8th Semester Bachelor of Technology in Aerospace Engineering, Alliance College of Engineering and Design (ACED), Alliance University, Bengaluru, hereby declare that the entire project work entitled "**Mechanics of Orbit using Python**" is an authentic record of the work that has been carried out independently by us during final year of our B.Tech at ACED, under the esteemed guidance **Dr. Gisa G.S**, Assistant Professor, Department of Aerospace Engineering, Alliance college of Engineering and Design, Alliance University.

This project report is submitted in partial fulfillment of requirements for the award of the degree of Bachelor of Technology in Aerospace Engineering. The results embodied in this dissertation are original and it has not been submitted in part or full for any degree in any University.

Place: Bengaluru
Date: 17/062021

Ramkiran.L
17030141AE007

Manjunath
17030141AE009

Monisha Patel A.
17030141AE012

Thoshitha R. Kumar
17030141AE027

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Abstract

Orbital mechanics is the study of the motions of artificial satellites and space vehicles moving under the influence of forces. It plays a vital role in planning space missions in various aspects such as designing orbital trajectory for various missions, calculating lagrangian points etc., and can find many engineering applications including ascent trajectories, reentry and landing, rendezvous computations, lunar and interplanetary trajectories.

In recent years, as there is a lot of progress unfolding in space industry, many aspiring students are keen on gaining knowledge and pursue careers in space industry. As such, strong foundations of the fundamentals are required for the students for them to get ahead in the field. There are lots of tools like STK, FreeFlyer etc., for learning but these don't start from the bare minimum of the concepts. This led to the idea of developing of MOPy.

Mechanics of Orbit using Python(MOPy) is learning tool designed and developed with the purpose of introducing the core concepts of Orbital Mechanics. MOPy uses a interactive UI with tool tips and a 3D Environment with an interactive virtual universe. The 3D Environment helps the learner to visualize the concepts in a much accessible and easier way.

1 Introduction

1.1 About Software

1.2 List of Features

1.3 Python Libraries Used

1.4 Market Research

1.5 Objective

2 Detailed Explanation of Each Feature

2.1 Feature Name

2.1.1 Theory

2.1.2 Algorithm

2.1.3 Front End Development

3 Conclusion

4 Future Scope

References

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