**Modular Orbital Mechanics Toolkit for Transfer Strategy Evaluation in Earth-Centric Orbits**

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Abstract

As an undergraduate student of BS Aerospace Engineering from the Philippines, I have observed that there is a significant lack of accessible visual aids and practical tools for applying theoretical concepts in orbital mechanics. This deficiency lags the learning process and contributes to slower progress within both academic and industry settings in the country. The purpose of this independent research and software, particularly the algorithm devised, served as a gateway to aid the needs of the students and boost their understanding with regard to orbital mechanics and astronautics. The software features a MATLAB-based algorithm and visualization system that serves as both a computational tool and an educational aid. It allows users to compare theoretical calculations with dynamic visual outputs, thereby validating and reinforcing the accuracy and applicability of their solutions in real-world contexts. The paper also contains the user manual and project structure, explaining how each line of code works along with the equations used to make everything possible. This was a side-project to aid my understanding of my orbital mechanics’ course. The knowledge gained from studying orbital mechanics is instrumental in diverse fields, including space exploration, satellite operations, and astronomical research.

**Keywords:** MATLAB; algorithm; orbital mechanics