UAEU جامعة الإمارات العربية المتحدة United Arab Emirates University

The College of Graduate Studies and the College of Sciences Cordially Invite You to a

Master Thesis Defense

Entitled

ORBIT PROPAGATION AND DETERMINATION ALGORITHMS FOR SATELLITE GROUND STATIONS.

by

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Date & Venue

10:30 am

Wednesday, 9 November 2022

https://teams.microsoft.com/l/meetup-join/19%3ameeting_MDQ1ZGZhNDgtMjFiZi00MzdmLWJjYzktZDJmYzE3MzZlOWRh%40thread.v2/0?context=%7b%22Tid%22%3a%2297a92b04-4c87-4341-9b08-d8051ef8dce2%22%2c%22Oid%22%3a%22a377bf26-0ff0-4166-b168-afaa7f33dbbb%22%7d

Abstract

The satellite orbital parameters are essential for satellite operations. With these parameters, it is possible to estimate the satellite position in the recent past and near future, which is essential to effectively plan satellite operations and associate satellite telemetry with geographical locations. However, for small or medium satellite operators who do not possess the infrastructure required to track their satellites, the problem of determining the satellite orbit is problematic. To access the orbit for their satellites, these organizations have to rely on third parties such as Celestrak. These entities provide the service free of charge but do not provide orbital parameters with the required frequency. Furthermore, another problem may arise during the mission's early phases. Suppose the satellite is launched together with a number of other satellites, as is often done for small satellites. In that case, it is also not known in the first days or weeks of the mission which orbital parameters are from which satellite launched in the group (Chiaradia et al., 2000). This project aims to address the problem of orbital parameter determination by using GPS data, Kalman filters and AI (genetic algorithm).

Keywords: Genetic Algorithm, GPS, Kalman Filters, Orbit Determination Algorithms, Orbit Propagation, Orbital Parameters, Satellite.