

## **ABSTRACT**

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**Title of the thesis:** Visual Contact for Communication Satellites  
Taking into Account The Effective Perturbed Forces

**Degree:** Ph. D. (Space Dynamics)

The importance of the communication technologies increases rapidly every day, because no one can live without using television, mobile, internet, ....etc. So; the satellites, which carry this technologies, have to contact with each other to cover all of the Earth's area all the time. In this thesis, an analytical expression for predicting the visibility periods between two satellites is developed for two cases (when the two satellites are in the same plane, and when the two satellites are in different orbital planes). Computational algorithms is expressed to compute the visibility function numerically. This visibility function is applied numerically on two important real types of communication satellites which are GPS and GEO taking into account the effective perturbed forces the gravitational perturbation, the solar radiation pressure, the luni-solar attraction.

**Keywords:** Visibility Function, Perturbation Forces, Rise-Set Problem, GPS, GEO

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