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FAULT PREDICTION IN SATELLITES USING MACHINE LEARNING TECHNIQUES

Abstract

Machine Learning is leading the development of state of the art systems in all aspects of satellites. This paper presents machine learning based techniques being applied on satellite housekeeping systems. Fault detection and handling is an important task commonly performed by the housekeeping module of a satellite. It is designed to check if all the other modules on the satellite are functioning correctly and if not, report the anomalies to the ground station and also take corrective measures. The major shortcoming of this method is that faults are detected after they have occurred. In many cases, it is too late to recover from the faults and thus the faulty modules have to be switched off. Sometimes this can lead to the failure of the satellite itself. This motivates the question – Is it possible to predict occurrence of a fault and take corrective measures before it is too late? This paper reviews the current methods used in fault analysis on satellites and explores fault prediction using machine learning techniques. The motivation behind this study is to predict faults that can occur in satellites and prevent them if possible. The performance of different models will be evaluated for fault prediction and the best ones will be compared with the current systems.