Outlier Identification in Spacecraft Monitoring Data using Curve Fitting Information

Fabien Bouleau[1] and Christoph Schommer[2]

[1] SES Engineering, Chateau de Betzdorf, `fabien.bouleau@ses.com`
[2] University of Luxembourg, Dept. of Computer Science and Communication, `christoph.schommer@uni.lu`

Abstract. Spacecrafts provide a large set of on-board components information such as their temperature, power and pressure. This information is constantly monitored by engineers, who capture the outliers and determine whether the situation is abnormal or not. However, due to the huge quantity of information, only a small part of the data is being processed or used to perform anomaly prediction. A common accepted research concept for anomaly prediction as described in literature yields on using projections (based on probabilities, estimated on learnt patterns from the past)[**?**] and data mining methods to enhance the conventional diagnosis approach[**?**]. Most of them conclude on the need to build a status vector. We propose an algorithm for efficient outlier detection that builds the patterns identity on the past data based on their curve fitting information. On top of statistical elements, each pattern is alloted a characteristics chart. This pattern identity enables fast pattern matching across the data. The pattern classification is done by using the users' anomaly reports for flagging. The match quality is measured by a relevance vector. As such the methodology applies to continuous signals and the algorithm mainly focuses on Fourier fit coefficients. This project is an interdisciplinary project between SES S.A. and UL.

References

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Keywords

OUTLIERS, ANOMALY DETECTION, DECISION SUPPORT, SPACE-CRAFTS.