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SPACE OPERATIONS SYMPOSIUM (B6)
New Operations Concepts and Commercial Space Operations (2)

Author: Mr. Marti Minoves
International Space University (ISU), Germany, marti@minoves.info

A.I. MULTI-AGENT SYSTEMS FOR ROBUST DECISION MAKING IN SPACE OPERATION

Abstract

Space Operations deal with very expensive elements and some of them are completely inaccessible and cannot be repaired in case of error. All decisions are taken very carefully to proceed always within the minimal risk and this requires an expensive constant human control.

Flight control Engineers analyze the telemetry received from the spacecraft to detect possible anomalies and when an anomaly is detected, it is also their job to investigate and characterize it.

The complexity in this process is that the telemetry may consist of 20 000 different parameters. Dealing with this amount of data and finding the parameters that may be related to the given anomaly is very labour intensive and currently only based on the engineer knowledge and experience.

This research will try to find automated tools to help on this process by addressing the following points:

- Better way to monitor telemetry
- Anomaly investigation: 1) Find related parameters/spacecraft subsystems or 2) find other occurrences of the same anomaly.

An Agent is an Artificial Intelligence entity capable of supporting to accomplish tasks on behalf of another entity, either human or computational. This technology is already used in the industry to improve control systems, reduce costs and increase safety.

Multi-Agent technology will be used as a base for the implementation and support of other technologies that share the same goal: help engineers with the monitoring and diagnostics tasks.