Artificial Intelligence applied to fault detection on-board spacecraft

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Objectives

1. Capture the feedback on the presentations of the session

   - General Q&A on the presentation

2. Evaluate the interest of the audience in the application of AI for Fault Detection

   - Convinced? Sceptical? No interest? No way?

3. Identify challenges and interest of covering Isolation and Recovery aspects.

   - Convinced? Sceptical? No interest? No way?

4. Identify the pros and cons, emerging techniques, gaps, …

   - Evaluate the overall interest

5. Establish top-level requirements for implementation in projects/IoD

   - Identify future activities to ensure selection by projects

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Capture the feedback

1. Challenges faced during the developments

2. Interest of AI techniques compared to traditional ones?

3. Application to low dynamic vs. highly dynamic environment

4. Does it worth the effort and increase in complexity?

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Interest of AI for Fault Detection

1. Challenges faced during development of the activities

2. Interest of AI techniques compared to traditional ones?

3. Application to low dynamic vs. highly dynamic environment

4. Does it worth the effort and increase in complexity?

Convinced? Sceptical? No interest? No way?

Challenges and interest of Isolation and Recovery aspects

1. Isolation and Recovery actions are very linked to the system.

    1. Is it possible to use an AI technique sufficiently generic?

    2. Is it possible to define standardised I&R actions?

2. What is the right level of autonomy to be given to the spacecraft?

    1. Inform ground operators

    2. Isolate error and perform the reconfiguration

    3. Initiate Safe mode

Pros and cons, emerging techniques, gaps

1. Can detect failure in advance with respect to traditional FDIR … but not always.

2. Validation and qualification processes still need to be consolidated

3. Machine Learning and different flavours of neural networks have been experimented. Any other technique?

4. What are the existing gaps to be filled by future activities?

Plea/Top-level requirements for implementation in projects

1. How to convince project to embark AI (in platform)?

2. Top requirements that can make possible/easy to embark AI?

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