

SPACE OPERATIONS SYMPOSIUM (B6)
Ground Operations - Systems and Solutions (1)

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MACHINE LEARNING APPLICATION FOR SPACECRAFT TELEMETRY ANALYSIS AND
PREDICTION OF FUTURE ANOMALIES

Abstract

The research has the aim to make use of automatic self-learning machines that can predict future states of the space systems based on the archived and real-time telemetry and telecommand data obtained by the spacecraft operation center.

The research has the output – the machine learning software application that can be widely used for:

- Failure Detection Isolation and Recovery (FDIR) analysis as the real-world modelling environment;
- System functional tests as the additional verification method of the Concept of Operations;
- spacecraft operators training to predict final spacecraft subsystems states in case of the intentionally induced anomalies;
- In-orbit commissioning and operations to reduce the risks of fatal mission anomalies.

The paper provides an overview of the application development steps, the difficulties encountered during the design and implementation on real world telemetry data from KazEOSat-2 (launched in 2014) and KazSTSat (to be launched in Q1 2018) missions.