Space applications:

<https://nepp.nasa.gov/docs/etw/2022/16-JUN-THU/0930-DelCastillo-Teverosky-CL-22-2950.pdf>

<https://c3.ndc.nasa.gov/dashlink/static/media/publication/IMS_JACIC.pdf>

^ LOOK INTO THIS

* Unlike rule-based systems, data-driven systems do not require system analysts to define nominal relationships among sensors
* Several data driven software tools have been successfully applied to aerospace operations for both real-time system monitoring and archived data analysis [1]. One such tool, Inductive Monitoring System (IMS) [2], uses a data mining technique called clustering to analyze archived system data and characterize nominal interactions between selected parameters
  + “Anomaly detection”
  + the learning algorithm builds a knowledge base of clusters from successively processed vectors of training dat
* During the monitoring operation, IMS reads and normalizes real-time or archived data values, marshals the data into the predefined vector structure, and searches the knowledge base of nominal operating regions to see how well the new data vector (i.e., the query vector) fits the nominal system characterization
  + \*Still requires constant monitoring
* Mentions what missions it’s been deployed on

<https://ntrs.nasa.gov/api/citations/20050157886/downloads/20050157886.pdf>

Testing in literature:

<https://www.mdpi.com/1424-8220/20/13/3740>

* Online capacitance monitoring of a capacitor
  + The advantage of this method is that additional component or signal injections are not required, which results in a low cost and small size solution for capacitor monitoring.
  + However, the reliability of this method depends on the accuracies of the sensors due to the small ripple voltage of the capacitor, which is approximately 1% of the capacitor voltage.
* Several advanced algorithms, such as the Adaptive Neuro-Fuzzy Inference System (ANFIS) and the Artificial Neural Network (ANN) algorithms, have been adapted to monitor the health status of capacitors
  + The ANFIS detects aging faults of the capacitors in the converter based on the aging relationships among the estimated EOL and the actual capacitor voltages by using curve fitting techniques. Utilizing the input data created at the normal and aging fault conditions of the capacitors, the ANFIS is capable of monitoring the health of capacitors

J. Bofill, M. Abisado, J. Villaverde, and G. A. Sampedro, “Exploring Digital Twin-Based Fault Monitoring: Challenges and Opportunities,” in *Sensors*, Aug. 2023. [Online]. Available: <https://www.mdpi.com/1424-8220/23/16/7087>

<https://blog.satsearch.co/2023-01-09-how-to-improve-satellite-health-monitoring-with-texas-instruments>

<https://ieeexplore.ieee.org/abstract/document/6737296>

* Power loss stuff: <https://www.sciencedirect.com/science/article/abs/pii/S0026271419304925>