NASA SBIR/STTR Technologies

ADVANCED DATA MINING AND DEPLOYMENT FOR IVHM AND THE SPACE VEHICLE LIFECYCLE

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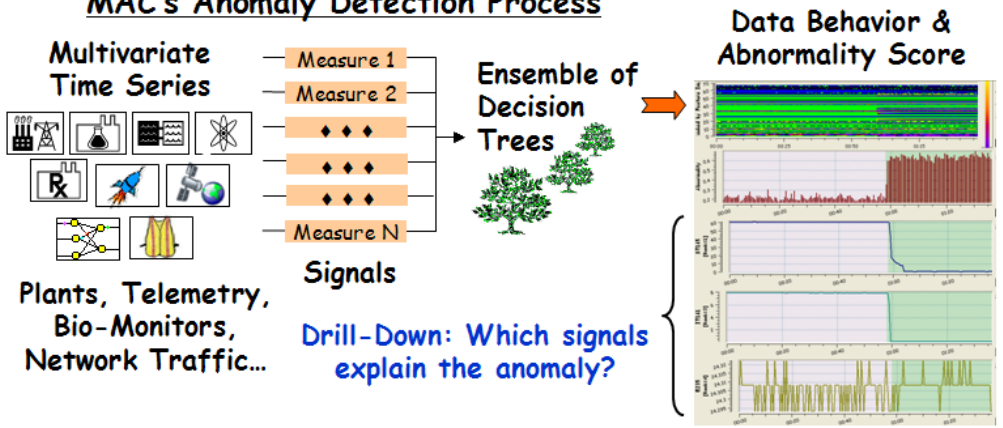
Identification and Significance of Innovation:

1. MAC's ***Taiga*** product will significantly increase the breadth and depth of analysis using Ensembles of Decision Trees (EDTs) for IVHM and other issues related to the lifecycle of NASA craft and equipment
2. ***Taiga*** complements and will be combined with existing software at NASA, including the Inductive Monitoring System and *Mariana*
3. Core ***Taiga*** algorithms will be automatically parallelized for NASA multi-core and clusters via a collaboration with Optillel Solutions

Expected TRL Range at the end of Contract (1-9): **5-6**

MAC's Anomaly Detection Process



Technical Objectives:

1. Implement ***Taiga*** for state-of-the-art Data Mining for IVHM and the Space Vehicle Lifecycle
2. Exploit synergy between NASA software and ***Taiga***
3. Develop working prototype of C++ Parallelization tool
4. Cultivate industry partners to qualify for Phase 2E

Work Plan:

Task Description	Objective	Responsibility
Requirements & Design	All Objectives	MAC, Optillel Solutions, NASA
Establish Synergy with NASA Tools	Objective 2	MAC, NASA
Implement *Taiga* Base System	Objective 1	MAC
Create *Taiga* GUI & Visualization Modules	Objective 1	MAC
Validate, Test & Demonstrate *Taiga*	Objective 1	MAC, LASP, GMV
Automate Parallelization	Objective 3	Optillel Solutions

NASA Applications:

1. Intelligent Systems Division
2. Intelligent Data Understanding Group
3. Discovery and Systems Health Tech Research Area
4. Other: Launch monitoring, Crew monitoring, Text processing, Fault Analysis in image sequences

Commercial Applications:

1. Chemical/Pharma/Manufacturing Plant Monitoring
2. On-Board State of Health for Planes, Autos, Marine
3. Network Security and Intrusion Detection
4. Surveillance and Perimeter Monitoring

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