

**PACKAGE ID** - 001292MLTPL01 MSET2V3.1

**KWIC TITLE** - Multivariate State Estimation Technique 2  
Version 3.1

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**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - LIM

**COMPLETION DATE** - 11/01/1999   **PUBLICATION DATE** - 11/01/1999

**DESCRIPTION** - MSET2V3.1 is a system that analyzes signals generated by an industrial plant or process. These signals are used to determine the current condition of an industrial process. Based upon a group of reference signals that is representative of a normal process, MSET2V3.1 can determine which signals, if any, are faulty or degraded. Faulty signals are then replaced in real-time with new, synthesized signals that more closely represent the true state of the system.

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - Media Directory; Software Abstract; Media Includes Source Code, Sample Problem Input and Output Data;/ 1 CD Rom

**METHOD OF SOLUTION** - The MSET2V3.1 system consists of three code modules. The first module contains training algorithms that collect reference signals from sensors during normal operation of the system. The second module contains parameter estimation algorithms that use the reference sensor signals to generate virtual sensor signals that represent the true behavior of the system. The third module contains statistically-based fault detection algorithms that compare the virtual sensor signal to current sensor observations to detect incipient deviation in sensor or system behavior. The training module contains two complementary algorithms: The MinMax and VectorOrdering algorithms. The parameter estimation module contains four complementary algorithms: the Vector Pattern Recognizer (VPR), Bounded Angle Ratio Test (BART), Vector Similarity Evaluation Technique (VSET), and Probabilistic State Estimation Method (PSEM) algorithms. The third module contains two complementary algorithms: Sequential Probability Ratio Test (SPRT) and Bayesian Conditional Probability (BCP) algorithms.

**COMPUTER** - MLT-PLTFM

**OPERATING SYSTEMS** - Unix, Windows 95, 98, and Windows NT

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**PROGRAMMING LANGUAGES** - C(80%) C++(20%)

**SOFTWARE LIMITATIONS** - None

**SOURCE CODE AVAILABLE (Y/N)** - Y

**UNIQUE FEATURES** - Signals found to be corrupt may be replaced in real-time with signals generated by MSET2V3.1 This allows industrial processes to continue even when monitored sensors malfunction.

**RELATED SOFTWARE** - Earlier MSET and MSET2 software releases.

**HARDWARE REQS** - V3.1 of MSET2 is operable on any hardware configuration capable of running the ANSI-standard C programming language.

**TIME REQUIREMENTS** - After a short initializaion (or training) period, MSET2V3.1 is designed to run in real time.

**SUBJECT CLASS CODE** - T

**KEYWORDS** -  
COMPUTER PROGRAM DOCUMENTATION  
M CODES

**EDB SUBJECT CATEGORIES** -  
990200

**SPONSOR** - DOE/ER

**PACKAGE TYPE** - AS - IS