

**PACKAGE ID** - 001139MLTPL00 SABLE

**KWIC TITLE** - Self-Tuning SPRT for Continuous Surveillance  
of Processes & Equipment

**AUTHORS** - Gross, K.  
Argonne National Lab., IL (United States)

Wegerich, S.  
Argonne National Lab., IL (United States)

Hoyer, K.K.  
Northwestern University, Chicago, IL (United States)

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

**COMPLETION DATE** - 01/01/1996   **PUBLICATION DATE** - 01/01/1996

**DESCRIPTION** - SABLE is an AI-based expert system for process and equipment operability surveillance in industrial applications that require high reliability, high sensitivity annunciation of degraded sensors, discrepant signals, or the incipience of system disturbances.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Media Includes Source Code;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 3.5 Diskette

**METHOD OF SOLUTION** - SABLE automates the process of setting up the tuning parameters for a sequential probability ratio test (SPRT). These parameters are specified using an adaptive, iterative procedure that assures the desired false-alarm and missed alarm probabilities are preserved for any process signals. A filter is first constructed to remove the largest contributors to the process serial correlation. Monte Carlo simulation is then employed to evaluate the asymptotic false alarm probability ( $\alpha$ ). If this empirical  $\alpha$  exceeds the design value, it is systematically reduced in an iterative fashion until it is less than or equal to the design value.

**COMPUTER** - MLT-PLTFM

**OPERATING SYSTEMS** - DOS, UNIX, VMS, AIX

**PROGRAMMING LANGUAGES** - C

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

**UNIQUE FEATURES** - SABLE produces a spectral filter that is optimal in the sense that it provides the maximum reduction in the degree of

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**UNIQUE FEATURES - (CONT)** serial correlation and non-normality for the process under surveillance. It then uses a unique signal synthesizer that enables the empirical false alarm probability to be evaluated without the expense of acquiring very long streams of experimental data.

**RELATED SOFTWARE** - SPRT modules

**HARDWARE REQS** - SABLE is operable on any hardware system that can run ANSI standard C software.

**TIME REQUIREMENTS** - Depending upon the degree of serial correlation SABLE identifies in the process noise, run times can vary from a few minutes to tens of minutes on an Intel 486 or a Sun SPARC-2 platform (the greater the degree of serial correlation, the longer the run time). This contrasts with hours of human and computer time when SPRT modules are trained manually.

**ABSTRACT STATUS** - Submitted 12/18/96. Released AS-IS 1/13/97

**SUBJECT CLASS CODE** - T

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
S CODES  
ARTIFICIAL INTELLIGENCE  
AUTOMATION  
ITERATIVE METHODS  
INDUSTRIAL PLANTS  
MONITORING  
ALARM SYSTEMS  
SENSITIVITY  
RELIABILITY  
EXPERT SYSTEMS  
ELECTRONIC EQUIPMENT  
SIGNALS  
MONTE CARLO METHOD  
PROBABILITY

**EDB SUBJECT CATEGORIES** -

990200 440800 426000

**SPONSOR** - DOE/ER

**PACKAGE TYPE** - AS - IS