

**PACKAGE ID** - 001184SUN0000 PEGA

**KWIC TITLE** - Parameter Estimation Using Genetic Algorithms

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

**COMPLETION DATE** - 01/03/1995   **PUBLICATION DATE** - 01/03/1995

**DESCRIPTION** - PEGA combines experimental modal results with Nastran frequency sensitivities to produce updated parameters for structural dynamic analysis.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Media Includes Executable Module, Help Files in HTML Format;

**SOURCE CODE INCLUDED?** - No

**MEDIA QUANTITY** - 1 Qic Cartridge

**METHOD OF SOLUTION** - Sensitivity analysis from nastran is used to construct a simple parabolic design space for minimizing the difference between test and analysis frequencies. Design parameters and frequencies are weighted, and constraints applied. The Genetic Algorithm (GA) minimizes the difference between the test and analysis frequencies while penalizing large design changes. A new iteration design model (nastran input deck) is produced.

**COMPUTER** - SUN

**OPERATING SYSTEMS** - HP UX 9.0 and above, and SunOs 4.1.

**PROGRAMMING LANGUAGES** - C

**SOFTWARE LIMITATIONS** - Maximum 256 parameters

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

**UNIQUE FEATURES** - The user has full control of the optimization procedure including individual weights applied to frequencies or design parameters. The GA insures that all design parameters naturally fall within the design goals. Interface to the nastran results and input decks provide a usable tool for model update. The entire process is accomplished within a graphical user interface.

**RELATED SOFTWARE** - MSC or CSA nastran design sensitivity modules.

**TIME REQUIREMENTS** - Typical re-estimation for one iteration requires about 5-10 minutes, independent of model size. When the structural model has been correctly parameterized, full parameter estimation can be completed in 3-6 finite element analysis iterations

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**TIME REQUIREMENTS - (CONT)**

**ABSTRACT STATUS** - Submitted 8/7/97. Released AS-IS 10/27/97

**SUBJECT CLASS CODE** - INL

**KEYWORDS -**

COMPUTER PROGRAM DOCUMENTATION  
P CODES  
MECHANICAL STRUCTURES  
COMPUTER CALCULATIONS  
EXPERIMENTAL DATA  
DATA COMPILATION

**EDB SUBJECT CATEGORIES -**

990200

**SPONSOR** - DOE/DP

**PACKAGE TYPE** - AS - IS