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Combinatorial Generation of Test Suites

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Testgen is a computer program that generates suites of input and configuration vectors for testing other software or software/hardware systems. As systems become ever more complex, often, there is not enough time to test systems against all possible combinations of inputs and configurations, so test engineers need to be selective in formulating test plans. Testgen helps to satisfy this need: In response to a test-suite-requirement-specification model, it generates a minimal set of test vectors that satisfies all the requirements.

Testgen generates test cases following a combinatorial approach, but instead of generating all possible combinations across all test factors, it generates a test suite covering all possible combinations among user-specified groups of test factors. Testgen affords three main benefits:

- The level of coverage of the test space can be increased or decreased easily by modifying the test model. Hence, the rigor of testing can be adjusted according to availability of time and resources.
- Within a test model, degrees of combinations can be adjusted separately for different subsystems.
- Typically, Testgen generates test cases in seconds, whereas manual generation of the same test cases takes hours, and Testgen never omits desired combinations or includes redundant test cases.

This program was written by Anthony C. Barrett and Daniel L. Dvorak of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-45921.