

研发、设计、测试

## 改进的SAMP SO的软件测试数据自动生成

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**摘要** 针对软件测试数据的自动生成提出了一种简化的自适应变异的粒子群算法(SAMP SO)。该算法在运行过程中根据群体适应度方差以及当前最优解的大小来确定当前最佳粒子的变异概率, 变异操作增强了粒子群优化算法前期全局搜索能力, 去掉了粒子群优化(PSO)算法中进化方程的粒子速度项, 仅由粒子位置控制进化过程, 避免了由粒子速度项引起的粒子发散而导致后期收敛变慢和精度低问题。实验结果表明该算法在测试数据的自动生成上优于基本的粒子群算法, 提高了效率。

**关键词** [软件测试](#) [测试数据生成](#) [简化的自适应变异](#) [粒子群算法](#)

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## Automated test data generation by improved Simple and Adaptive Mutation Particle Swarm Optimization algorithm

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### Abstract

An improved Simple and Adaptive Mutation Particle Swarm Optimization (SAMP SO) algorithm is proposed here based on the combination of simple particle swarm optimization and adaptive mutation particle swarm optimization for automated software test data generation. During the run time, the mutation probability for the current best particle is determined by two factors: the variance of the population fitness and the current optimal solution. The mutation operator is designed to enhance the global search capability of PSO algorithm at starting. The particle velocity is discarded. The evolutionary process is only controlled by the variables of the particle position. Test examples show that it is better than basic particle swarm optimization algorithm and can improve the efficiency of automated test data generation.

**Key words** [software testing](#) [test data generation](#) [simple and adaptive mutation](#) [Particle Swarm Optimization \(PSO\)](#)

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