

一种基于拟牛顿法蝙蝠算法的网络故障检测方法

张义良, 罗晓娟

(萍乡学院 计算机系, 江西 萍乡 337055)

摘要: 针对现有的网络系统故障检测方式存在的检测精度不高、检测收敛速度慢和易陷入局部最优问题, 综合了蝙蝠算法和拟牛顿法, 提出了一种基于差分进化蝙蝠算法的网络系统故障检测方法(Quasi Newton-Bat Algorithm, QN-BA). 该方式通过搭建滤波模型和残差模型, 结合拟牛顿法蝙蝠算法得到模型的最优解, 有效地规避了现有方式存在的问题. 最后通过仿真实验深入研究了影响该故障检测方法的主要因素, 并对比分析了该方法与 NPSO-PF (新型粒子群优化滤波算法) 和 LWRLR (变学习率变加权递推最小二乘算法) 的性能, 验证了其有效性.

关键词: 故障检测; 蝙蝠算法; 拟牛顿法; 残差

A Network System Fault Detection Based on

Quasi Newton-Bat Algorithm

ZHANG Yi-liang, LUO Xiao-juan

(Department of Computer Science, Pingxiang College, Pingxiang 337055, China)

Abstract: In order to effectively solve the problems consisted in the method of existing network system fault detection, the problems includes that detection accuracy is not high, the detection convergence speed is slow, and it's easy to fall into local optimum. In this paper combined with the Bat Algorithm (BA) and Quasi Newton (QN) strategy, a novel model of network system fault detection based on QN-BA is proposed. In this way, the optimal solution of the model is obtained by combining the filtering model and the residual error model, which can effectively avoid the existing problems. Finally through the simulation experiment obtained the fault detection performance index chart, and by comparing the NPSO-PF and LWRLR verify the effectiveness of the proposed approach.

Key words: fault detection; bat algorithm; quasi Newton method; residual error

作者简介:

张义良 男, (1978-), 硕士, 副教授. 研究方向为计算机网络. E-mail: zhangyl1978@163.com.

罗晓娟 女, (1975-), 硕士, 副教授. 研究方向为计算机网络.