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基于MAS的航天器故障诊断系统模型

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摘要 为了实现航天器故障处理的实时性、智能性，本文构建了基于MAS(Multi Agent System)的航天器故障诊断系统模型。该结构通过分层实现了系统级诊断、缩小计算空间及加快隔离故障源。诊断智能体根据本系统的领域知识特点，建立自己的智能诊断模型，能够自主处理紧急故障；多个智能体能够协同并行地工作，提高了诊断速度。本文还构建了基于HLA(high level architecture)的故障诊断系统的仿真平台，通过仿真证明了该航天器故障诊断系统模型的优越性，也验证了仿真平台的可行性。

关键词 航天器,MAS,诊断系统模型,分层诊断,HLA

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MAS based fault diagnosis system model of spacecraft

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Abstract To realize real time and intelligence in fault diagnosis system, a Multi Agent System (MAS) based fault diagnosis system model of spacecraft was proposed. The framework of the model realizes system level diagnosis by hierarchical strategy, reduces computer space, and accelerates the isolation of fault source. The diagnosis Agent may construct its own diagnosis model according to the features of the domain knowledge of the subsystem, and can autonomously deal with emergency fault. Multi Agents can accomplish mission coordinately, thus the diagnosis efficiency is improved due to concurrent work. Furthermore, a High Level Architecture (HLA) based fault diagnosis system simulation platform is constructed. Simulation results show the superiority of the proposed fault diagnosis system model and validate the simulation platform.

Key words spacecraft MAS diagnosis system model hierarchical diagnosis HLA

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