Impact Position Method Based on Distributed Structure Multi-Agent Coordination with JADE

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Abstract : For the impact monitoring of distributed structures, the traditional positioning methods are based on the time difference, which includes the four-point arc positioning method and the triangulation positioning method. But in the actual operation, these two methods have errors. In this paper, the Multi-Agent Blackboard Coordination Principle is used to combine the two methods. Fusion steps: (1) The four-point arc locating agent calculates the initial point and records it to the Blackboard Module.(2) The triangulation agent gets its initial parameters by accessing the initial point.(3) The triangulation agent constantly accesses the blackboard module to update its initial parameters, and it also logs its calculated point into the blackboard.(4) When the subsequent calculation point and the initial calculation point are within the allowable error, the whole coordination fusion process is finished. This paper presents a Multi-Agent collaboration method whose agent framework is JADE. The JADE platform consists of several agent containers, with the agent running in each container. Because of the perfect management and debugging tools of the JADE, it is very convenient to deal with complex data in a large structure. Finally, based on the data in Jade, the results show that the impact location method based on Multi-Agent coordination fusion can reduce the error of the two methods.

Keywords : impact monitoring, structural health monitoring(SHM), multi-agent system(MAS), black-board coordination, JADE
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