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Impact Location Based on Multy-Agent Co-ordination and Fusion for Large Structures

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In practical applications of structural health monitoring technology, a large number of distributed sensors are usually adopted to monitor the big dimension structures and different kinds of damages. The monitored structures are usually divided into different sub-structures and monitored by different sensor set. Under this situation, how to manage the different sensor set and fuse the distributed information to obtain a fast and accurate evaluation is an important problem to be addressed deeply. In the paper, multi-agent framework based impact monitoring method is presented to deal with the impact damage location problem in the large structure. The monitoring system firstly self-judges whether the impact event happens in monitored sub-region, and focuses on the impact source on the sub-region boundary to obtain the sensor network information with blackboard model. Then the service directory is used to dynamically distribute the damage location function module. Lastly a reliable assessment for the whole structure is given by fusing the sub-regions' evaluation results. The proposed multi-agent approach is illustrated through a large aerospace aluminum plate structure experiment. The result shows that the method can automatically and effectively monitor the impact source in each sub-region, particularly near the border upon sub-region in the large-scale structure.

Ключевые слова:

Содержание.

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