SOA-based distributed fault prognostic and diagnosis framework: an application for preheater cement cyclones

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Published Online: April 20, 2021 • pp 1-18 • https://doi.org/10.1504/IJIMS.2021.114539

Abstract

Complex engineering manufacturing systems require efficient online fault diagnosis methodologies to improve safety and reduce maintenance costs. Traditionally, diagnosis and prognosis approaches are centralised, but these solutions are difficult to implement on distributed systems; whereas a distributed approach of multiple diagnosis and prognosis agents can offer a solution. Also, controlling process plant from a remote location has several benefits including the ability to track and to assist in solving a problem that might arise. This paper presents a distributed and over prognosis and diagnosis approach for physical systems basing on multi agent system and service-oriented architecture. Specifics prognostic and diagnostic procedures and key modules of the architecture for web service-based distributed fault prognostic and diagnosis framework are detailed and developed for the preheater cement cyclones in the workshop of SCIMAT clinker. The experimental case study, reported in the present paper, shows encouraging results and fosters industrial technology transfer.

Keywords

intelligent fault diagnosis, e-diagnosis, remote fault prognosis, web services, service-oriented architecture, SOA, preheater cement cyclone, SMA, internet manufacturing

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