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An integrated intelligent approach to process diagnosis in process industries. (English)

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Summary: An integrated intelligent approach to enhancing process diagnosis automation (IIPD) is presented. A parallel hierarchical architecture is developed for IIPD, where various subsystems are coordinated by a meta-system. As the kernel of IIPD, the meta-system is endowed with a better understanding of diagnostic problem-solving and aims at large scale knowledge integration. Subsystems include domain expert systems and numerical routines that may be written in different languages or programming tools and may be used separately in different stages of the diagnostic process. An object-oriented knowledge language is also developed for organizing both meta-knowledge and domain diagnostic knowledge. This frame-based representation facilitates a hybrid utilization of diagnostic knowledge at both shallow and deep levels. Preliminary results have shown the potential of applying the integrated intelligent approach to complex process diagnosis.

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