

# Model-based Systems – Theory and Industrial Applications

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## **Abstract:**

Model-based diagnosis (MBD) systems developed in Artificial Intelligence solve their tasks by searching for system models that agree with the observations of the system's behavior. MBD, or more precisely consistency-based diagnosis, is based on a rigorous logical formalization to define and identify the solutions. Such systems contain an explicit, conceptual representation of the system to be diagnosed. These models are compositional and often expressed at a qualitative, rather than numerical, level. The technology has already been applied to industrial problems, such as automotive systems and spacecraft. We present the basic ideas of this approach, outline some of the theoretical foundations, discuss some application examples, and discuss how model-based systems can, beyond the scope of diagnosis, support and integrate different work processes during the product life cycle.