A Framework for Inconsistency Detection across Heterogeneous Models in Industry 4.0

Abstract:
Manufacturing systems nowadays get more interconnected and flexible. Developing such a system appeals for closer interdisciplinary collaboration. Various models are used by different engineers to shape specific views on the system, but might also introduce contradictions, i.e. inconsistencies, leading to engineering delays or failures. However, detecting inconsistencies is challenging and usually in an ad-hoc way. Knowledge base, a technology which stores knowledge formally for automatic problem-solving, can facilitate interoperability across heterogeneous models. This study proposes a knowledge-based framework for inter-model inconsistency detection and model validation. A prototype of the framework is implemented and evaluated.

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