

Multi-Level Meta-Modeling for Enabling Dynamic Subtyping for Industrial Automation

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Abstract : Modern industrial automation relies on service oriented concepts of Internet of Things (IoT) device modeling in order to provide a flexible and extendable environment for service meta-repository. However, state-of-the-art meta-modeling techniques prefer design-time modeling, which results in a heavy usage of class sometimes unnecessary static subtyping. Although this approach benefits from clear-cut object-oriented design principles, it also seals the model repository for further dynamic extensions. In this paper, a dynamic multi-level modeling approach is introduced that enables dynamic subtyping through a more relaxed partial instantiation mechanism. The approach is demonstrated on a simple sensor network example.

Keywords : meta-modeling, dynamic subtyping, DMLA, industrial automation, arrowhead

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