Abstract:
Industrial manufacturing processes are complex processes, where transparency of every process step is necessary to achieve a high level of quality and efficiency. In order to achieve this transparency, manufacturing execution systems (MES) are used. However, as these systems are very expensive, mainly due to individual programming effort, MES usage is oftentimes limited to larger companies. To ultimately reduce implementation costs for MES, the project AutoMES proposes a standardized, model-based approach to facilitate automatic generation of MES functions. This paper presents requirements on a suitable modeling language, as well as how these requirements are fulfilled by the modeling language used in the AutoMES project, a current research project aiming to automatically generate MES code with a model-based approach. The modeling language is an extension of the MES Modeling Language (MES-ML), a modeling language for the specification of MES. With the use of the extended MES-ML it is possible to generate a generic, machine-usable MES specification which can then be used for code generation. To evaluate the proposed modeling language extensions, an industrial brewing process has been modeled and verified by MES engineers during the project AutoMES.