Abstract:

Technical Debt (TD) is a well-known and beneficial concept in software engineering, but almost unknown in the domain of automated Production Systems (aPS). There, software is always related to automation as well as mechanical hardware and safety issues need to be especially considered. Therefore, the concepts of TD need adaptation for software in aPS. This paper focusses on safety aspects and related modes of operation as well as fault handling, which were already identified as challenges for software architecture in aPS. Four industrial use cases as well as safety norms and three software guidelines provided from industrial aPS companies are taken as a basis for the development of checklists to avoid TD on the one hand and enhancing TD classifications for aPS software on the other hand. The identified TD aspects were validated using results from a questionnaire including more than 70 German industrial companies from this domain.