

Loosening Assumptions in Object-Centric Process Mining (Extended Abstract)

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Object-centric process mining techniques provide an encapsulating view on interacting business processes. As a result, sophisticated analytical insights are achievable based upon them. However, real-life initiatives involving such techniques sometimes only exploit object-centricity to a limited extent. One key reason is that many existing analysis techniques make, sometimes implicit, assumptions about the properties of the underlying business processes, which do not always hold in practice. As a result, a range of algorithmic challenges arise that, when solved, could improve the utility of object-centric process mining.

The typical analytical pipeline for event logs consists of 1) discovering a process model for them, 2) verifying the models representational quality, and 3) identifying deviating executions of the process. All three stages are subject to restrictive assumptions in the object-centric setting. The state-of-the-art approach for object-centric process discovery applies a divide-and-conquer approach that constructs individual control flows for each object type and merges them into a single model [1]. This implicitly assumes that different object types agree on the control flow relation between activities, and otherwise results in behaviorally unsound process models. Corresponding object-centric conformance checking techniques assume that no additional objects can be generated [2, 4]. However, this is often a viable option in real-life, leading to biased diagnostics in such situations. Techniques to determine individual process executions, with potentially unintended behavior, implicitly assume the absence of resource-like objects or multi-instances [3]. This restricts the types of objects that can be analyzed.

The limitations that such assumptions pose on the applicability of the corresponding techniques, translate to algorithmic challenges that should be addressed. We propose that future work should 1) explicitly identify assumptions of existing and newly proposed techniques 2) provide measures to quantify to which extent these assumptions are valid for a given log and 3) develop new techniques for situations in which they clearly do not hold. This would improve the utility of object-centric process mining, by enabling a more informed selection of analysis techniques and by diversifying their range of real-life use cases.

References

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