

Bachelor's or Master's Thesis (or Project for a PR)

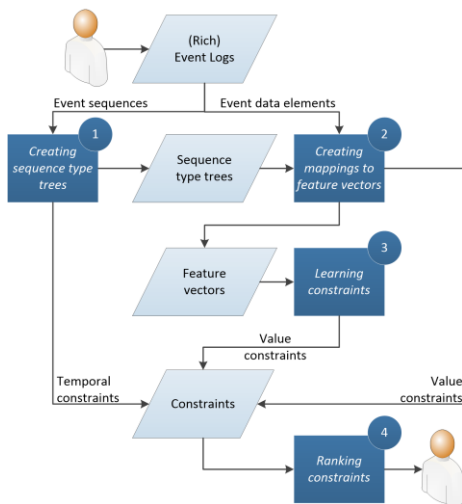
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A Tool to Support Mining Constraints for Monitoring Systems of Systems

In the context of the **REMINDS** Monitoring Framework

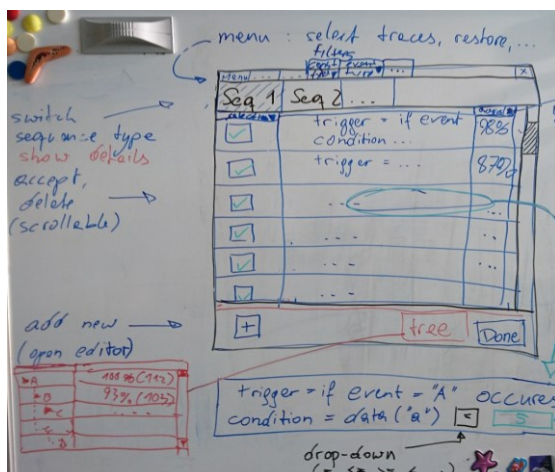
REMINDS (<http://mevss.jku.at/reminds>) [1] is a tool-supported framework for monitoring systems of systems at runtime. It comprises a flexible runtime monitoring infrastructure providing support for different roles and a requirements monitoring model covering the requirements to be monitored, the constraints checking adherence of a system's behavior to its requirements, the events and data produced by systems at runtime, and the probes instrumenting systems to intercept events and data at runtime. REMINDS can check constraints on event occurrence, order, and timing, and also perform data checks. Constraints need to be defined and maintained manually, which requires deep domain knowledge.

The events collected from certain system parts often form different (recurring) patterns. We are developing an approach to automatically mine constraints from these recurring patterns (cf. the figure to the left). The aim of this thesis/project is to develop a tool to support this constraint mining process, e.g., visualizing the recurring patterns, allowing to configure and fine-tune the mining process, as well as presenting and mined constraints (ranked according to diverse criteria) for selection by the user.



The tool (GUI draft figure below) should be developed independent from REMINDS (but prepared for later integration), thus the use of Java and Eclipse (e.g.; GEF/Zest) is recommended. The existing constraint mining algorithms as well as monitored events (to evaluate the tool) will be provided.

Detailed requirements will have to be negotiated with the developers of REMINDS. It is expected that the developed tool is easily extensible and follows the MVC pattern, i.e., separates the actual GUI from a model and from a controller.



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[1] T. Krismayer, R. Rabiser, and P. Grünbacher, Mining Constraints for Event-based Monitoring in Systems of Systems, Proc. of the 32nd IEEE/ACM International Conference on Automated Software Engineering (ASE 2017), Urbana-Champaign, Illinois, USA, 2017.

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