

Online Plausibility Checks for Patient Pathways with Medical Ontologies

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Problem Statement. A patient pathway describes all events recorded during the treatment of one specific patient. In the field of PODS4H, data quality issues (e.g., completeness, timeliness, or plausibility) remain a major challenge [1]. In an online setting (cf. Online Process Mining, as introduced in [2]), the *completeness* of the patient pathway is unknown. Hence, other quality checks, e.g., the verification of guideline compliance, become more arduous.

Objective. In this poster, we discuss how to measure the plausibility of an online patient pathway, i.e., an ongoing patient encounter. We want to validate if the currently observed pathway remains plausible whenever new events are recorded.

Approach. We utilize the Shapes Constraint Language (SHACL³) to continuously validate patient pathways. The pathway, that is, the *online* process instance, is modelled as continuously growing Resource Description Framework (RDF⁴) data graph. This data graph is validated against a shapes graph, a publicly available Web Ontology Language (OWL⁵)-based medical ontology. We plan to use SNOMED-CT or parts of it as shapes graph. This approach is based on previous work in the industrial domain [3].

Discussion. We discuss this vision and expected challenges with the PODS4H community, specifically: (1) how to model the data graph, i.e., the online process instance, (2) how to construct generic SHACL constraints, and (3) whether the expressiveness of SNOMED-CT is sufficient for this use case.

References

1. Munoz-Gama, J., Martin, N., et al., Process Mining for Healthcare: Characteristics and Challenges, *Journal of Biomedical Informatics*, Volume 127, 2022.
2. van der Aalst, W. *Process Mining: Data Science in Action*. Vol. 2., Springer, 2016.
3. Buchgeher, G., Ehrlinger, L., et al.: Representing Technical Standards as Knowledge Graph to Guide the Design of Industrial Systems (Extended Abstract). 18th International Conference on Computer Aided Systems Theory, 2022.

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³ <https://www.w3.org/TR/shacl>

⁴ <https://www.w3.org/TR/rdf-primer>

⁵ <https://www.w3.org/TR/owl2-overview>