Active Learning of Automata for JSON-Streaming Validation

Highlights of Logic, Games, and Automata

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What is a JSON document?

```
{
    "day": 29,
    "place": {
        "city": "Paris",
        "country": "France"
    },
    "authors": ["Bruyère", "Pérez", "Staquet"]
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- An array is an ordered collection of values.

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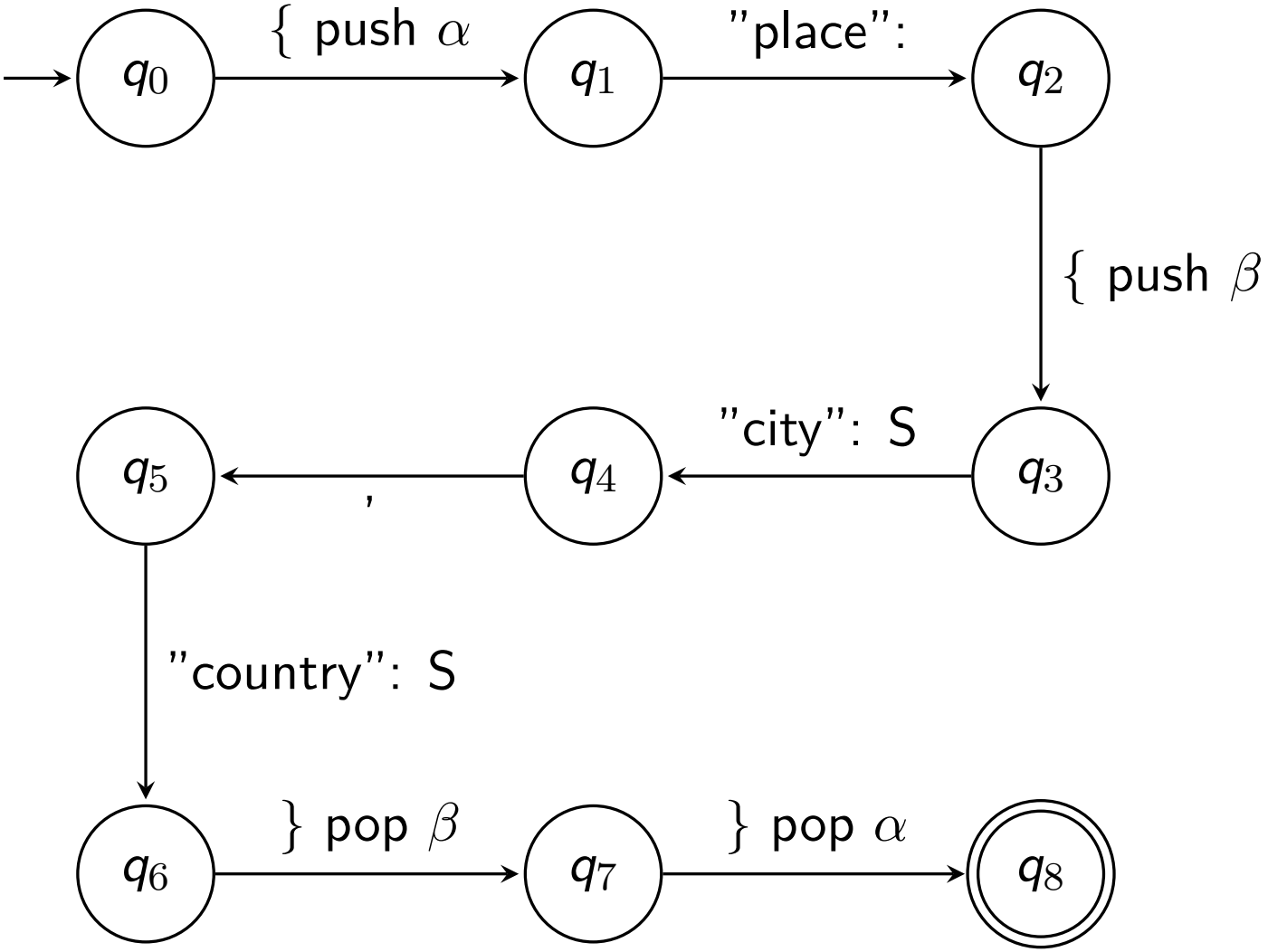
$\hookrightarrow$ Use pushdown automata-based techniques!

(Visibly) pushdown automaton



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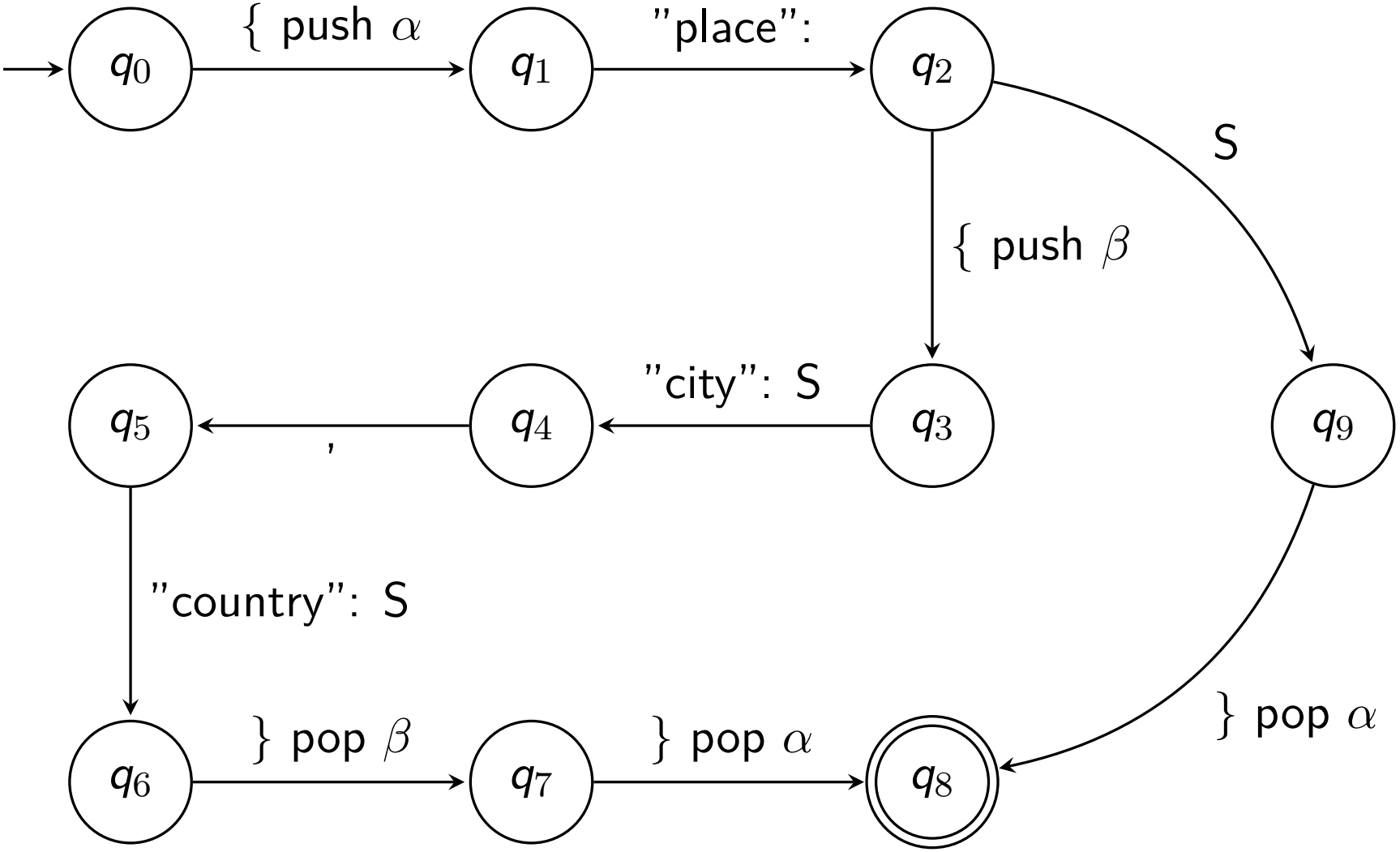
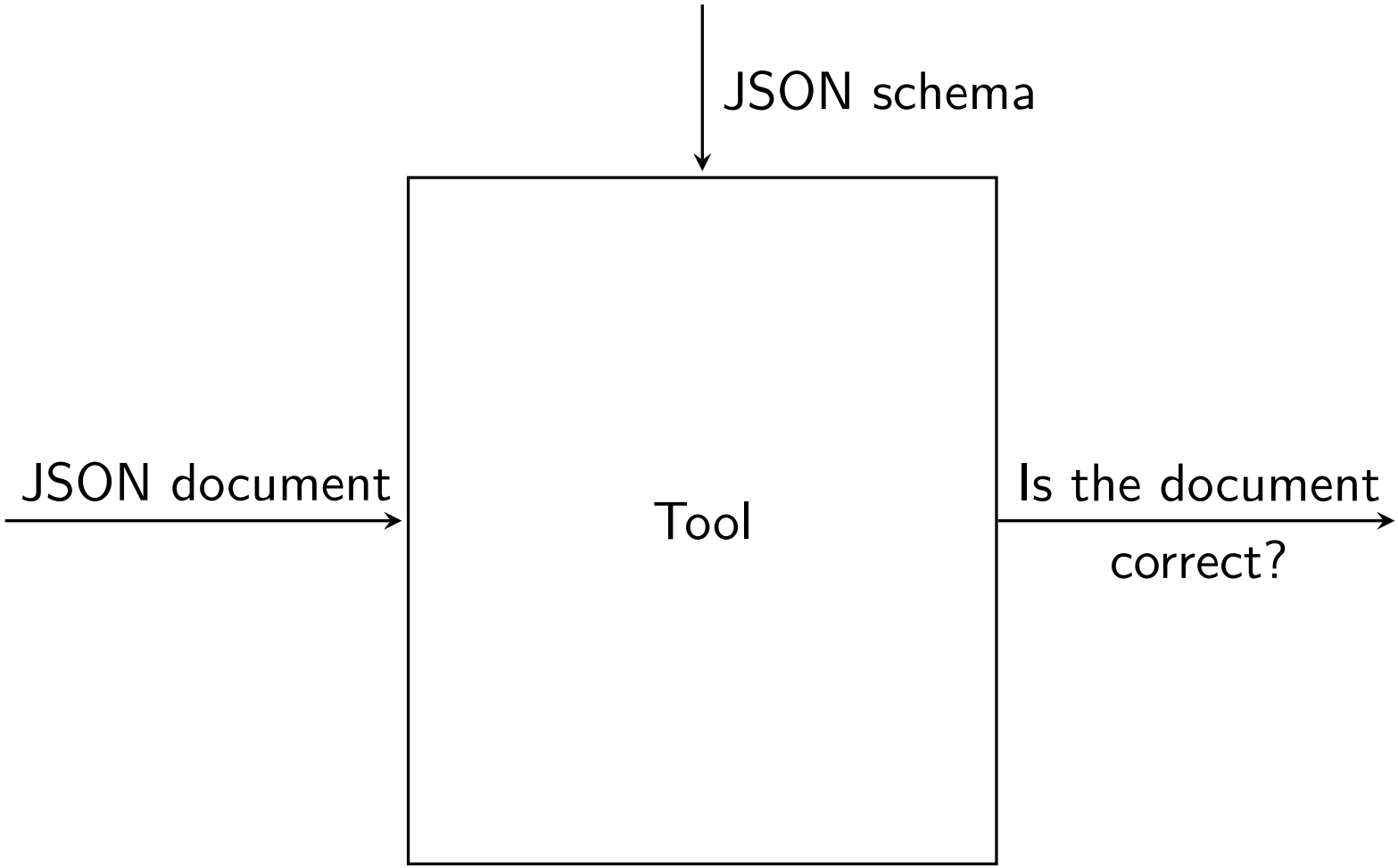


Our framework



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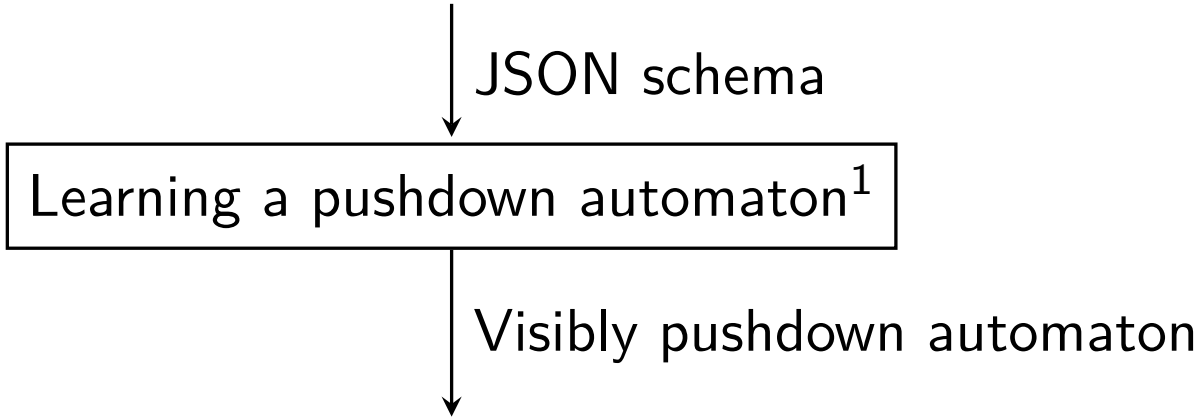

[1] Isberner, "Foundations of active automata learning: an algorithmic perspective", 2015.

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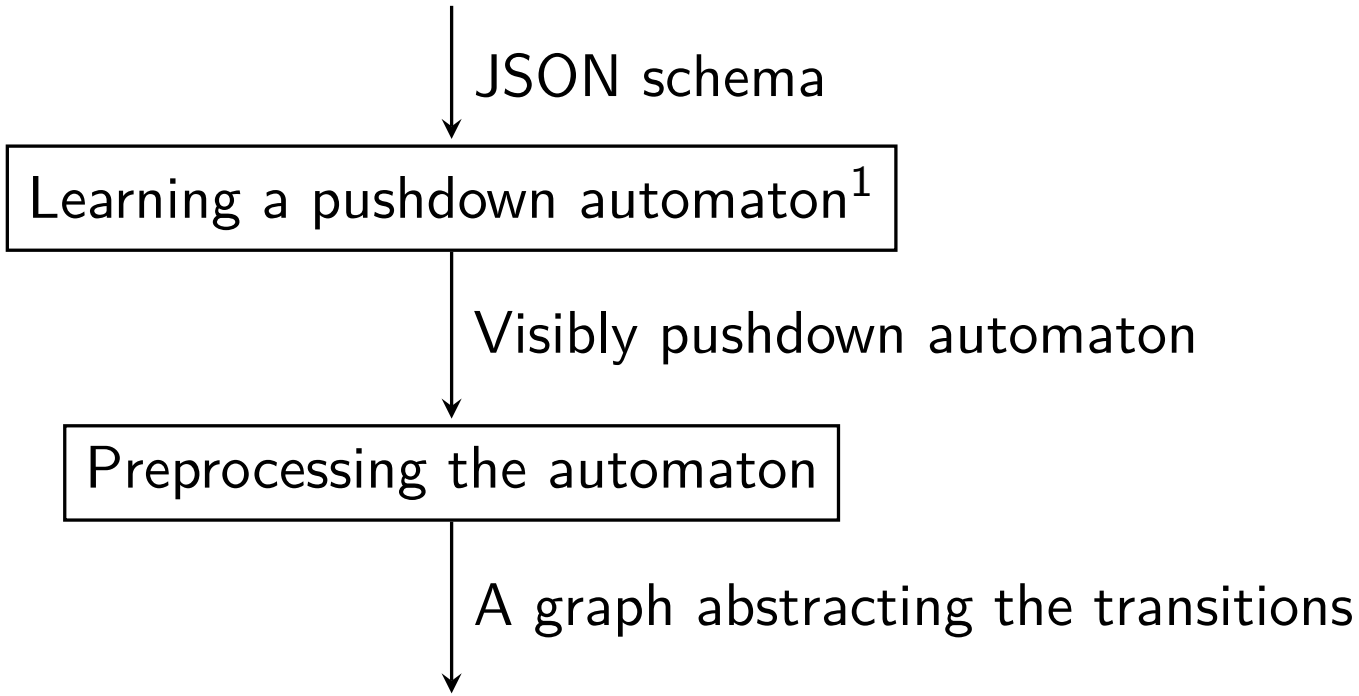

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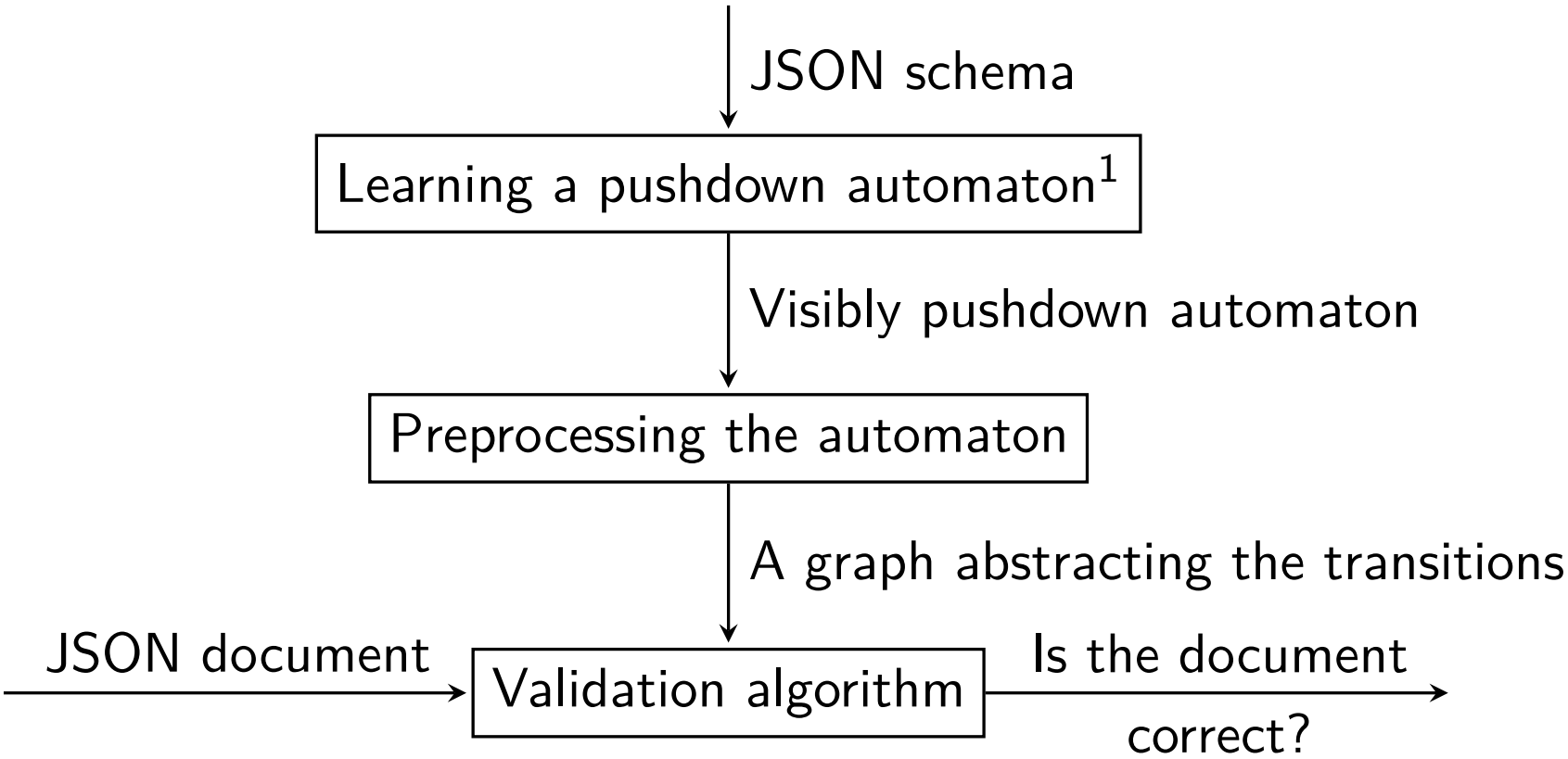

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Main contributions

1. For any schema S, we proved there always exists a visibly pushdown automaton that can decide whether a document satisfies S.
   $\hookrightarrow$ But fixing an order on the key-value pairs yields a much smaller automaton.

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$\hookrightarrow$ Work in progress.

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References I

 Isberner, Malte. “Foundations of active automata learning: an algorithmic perspective”. PhD thesis. Technical University Dortmund, Germany, 2015. URL: http://hdl.handle.net/2003/34282.