#11 Linear Conjunctive Reachability as Tensor Completion

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Submission (567kB) 1 Apr 2023 2:55:21am EDT · 8c7b85ae

▶ Abstract

Brzozowski (1964) defines a regular expression derivative as the suffixes which complete a

[more]

▶ Authors

B. Considine, X. Si [details]

	OveMer	RevExp
Review #11A	1	1
Review #11B	3	3
Review #11C	1	1

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Review #11A

Overall merit

1. Reject

Reviewer expertise

1. No familiarity

Paper summary

This extended abstract presents a technique for solving various problems in formal languages through solving systems of equations over finite fields. Such systems can be encoded as arrays,

which I assume is the connection to the topic of the ARRAY workshop.

I will be honest: apart from the fundamental language theory, I have very limited knowledge of the area this dense abstract explores, and while the parts I do comprehend look sensible, I cannot vouch for everything here (although the problem area is quite interesting - interpreting language problems as systems of equations is a fascinating area).

My main concern is that I'm not sure how approachable this material is to the typical ARRAY audience member. Since the submission is an extended abstract that doesn't go into the proceedings, I don't really have a problem with accepting it, but I must admit I don't understand why the authors picked ARRAY as their venue.

Comments for authors

For the presentation, I suggest focusing on concrete examples, or the array-based thinking behind this, rather than the more abstract mathematics.

Review #11B

Overall merit

3. Weak accept

Reviewer expertise

3. Knowledgeable

Paper summary

This extended abstract proposes a technique on recognising sentences of the given context-free language within a certain Levenshtein distance. The novelty of the work is the ability to reduce the problem to solving a system of multilinear equations.

Comments for authors

I believe that the general idea of this work is very relevant for the array community. Array languages shine when applied to the problems based on regular structures; however, dealing with irregular structures such as graphs is less straight-forward. Therefore, it would be great to learn how to turn parsing-like problems into array-like problems in a fundamental way.

As for the abstract, it is very heavy on the notation that is not familiar to a typical ARRAY workshop participant. I am not an expert in the field of CFGs; I think that I can follow the ideas, but I constantly have the feeling that this might be one of these AI-generated papers that tests whether reviewers actually read the papers :) One thing that is difficult to understand is the boundary between the background work and your contributions. You never reference figures 1 and 2 in the text; you mention connection with the SAT and GPU, but it is unclear whether this is a general remark, or something that you explore.

Now, as this is an extended abstract that won't be published anywhere, I am still interested to hear your talk. However, I strongly suggest to focus on the array part of your work, rather than on the

language theory part. If you find that language theory bits are crucial to understanding of your method, you have to spend much more time explaining them. However, I do believe that you can easily avoid them and focus on the problems of representing your tensors, efficiency, correctness guarantees, etc.

Review #11C

Overall merit

1. Reject

Reviewer expertise

1. No familiarity

Paper summary

This paper very much sounds like a chatGPT-generated paper. If this is written by a human, I strongly suggest to carefully describe the context and contribution within abstract and introduction. Furthermore, you need to set up the context properly when trying to describe your actual contribution. EG what has your content of Section 2 to do with Galois representations?