ContextFree Wars: The RedisGraph Strikes Back

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Figure 1: Episode IV: A New Hope

ABSTRACT

A long time ago in a galaxy far far away...

1 INTRODUCTION

CFPQ is a way to use grammars.

CFPQ is widely spread and gain popularity last years.

Application for real-world data analysis is a problem. First of all, the performance problems. Jochem Kuijpers [2]. There are no full-stack solutions, only separated algorithms, For example, recently graph segmentation in data provenance analysis was reduced to CFPQ [?], but authors faced the problem during the evaluation of the proposed approach: no one graph database support CFPQ. Thus, it is necessary to provide !!!

In [1] Rustam Azimov propose a matrix-based algorithm for CFPQ. This algoritm is one of promissing way to provide appropriate solution for real-world daata analysis: it was shown that !!! But the proposed algorithm

All-pairs is a classical problem. What about single-source and multiple-source? We propose a matrix-based multiple-source CFPQ algorithm.

Also, we provide full-stack support of CFPQ. We implement a Cypher query language extension[1] that allows one to express context-free constraints, and extend the RedisGraph graph database to support this extension. In our knowledge, it is the first full-stack implementation of CFPQ.

The following contribution.

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[1]!!!

(1) Multiple-source matrix-based CFPQ algorithm. Single-source as a partial case.
(2) Evaluateion of two versions of this algorithm.
(3) RedisGraph extending to provide full-stack support of CFPQ.

2 PRELIMINARIES

Coomon definitions which will be used in this paper.

2.1 Graphs

labelled digraph, matrices, ...

2.2 Languages

Grammars, normal form, ...

2.3 Matrix-Based Algorithm

Description

3 MATRIX-BASED MULTIPLE-SOURCE CFPQ ALGORITHM

New algo description.

3.1 Implementation Details

Algo implementation details: python, graphBLAS, smthng else? Two versions.

3.2 Algorithm Evaluation

And comparison. With combinators, GLL (.NET version).

Evaluation setup.

Tables.

Results.

Conclusion.

4 REDISGRAPH EXTENDING

In order to provide full-stack support of CFPQ we choose an appropriatr graph DB.

4.1 Cypher

parser extending, proposal, ...
Examples of queries.

4.2 RedisGraph

CFPQ to matrix expressions, etc.
Limits, restrictions, etc.

4.3 Evaluation

Small basic evalustion on real-world graph (geo?). In order to show, that performance is reasonable.

5 CONCLUSION

Conclusion
Future research
Formal translation of Cypher to linear algebra. In order to formalize limita and restrictions.
Experiments on unified evaluation of RPQ and CFPQ (tensors?)
More applications.

REFERENCES

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