

Scheduling Tree Operations

CODAS's ANR Project Deliverable #2

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1 Introduction

In the context of the CODAS's project, we studied how to define a language for tree structural transformations and designed a preliminary code generation for this language REW.

2 Contribution

Algebraic data types provide a natural framework to efficiently describe in-place transformations as rewrite rules. Such representation could take advantage of parallelism opportunities that appear in tree-like structures. We propose early steps towards a new technique to compile pattern matching as parallel in-place modifications of the underlying memory representation. Towards this goal, we combine the usual language approach which is common in pattern-matching compilation with tools from the polyhedral model, which is commonly used in high-performance code generation to output efficient C code. In the paper we propose a formalisation as well as a prototype implementation.

This work was published at GPCE 2021, for which we give the following Bibtex entry :

```
@inproceedings{gpce21:hal-03355377,  
  TITLE = {{Compiling pattern matching to in-place modifications}},  
  AUTHOR = {Iannetta, Paul and Gonnord, Laure and Radanne, Gabriel},  
  URL = {https://hal.archives-ouvertes.fr/hal-03355377},  
  BOOKTITLE = {{GPCE 2021 - 20th International Conference on Generative Programming:  
  Concepts \& Experiences}},  
  ADDRESS = {Chicago \& Virtual, United States},  
  YEAR = {2021},  
  MONTH = Oct,  
  DOI = {10.1145/3486609.3487204},  
  KEYWORDS = {compilation ; ADT ; rewriting ; code generation},  
  PDF = {https://hal.archives-ouvertes.fr/hal-03355377/file/gpce2021-cursors.pdf},  
  HAL_ID = {hal-03355377},  
  HAL_VERSION = {v1},  
}
```

as well as the url with the complete author version of the work [1]

<https://hal.archives-ouvertes.fr/hal-03355377>

Références

- [1] Paul Iannetta, Laure Gonnord, and Gabriel Radanne. Compiling pattern matching to in-place modifications. In *GPCE 2021 - 20th International Conference on Generative Programming : Concepts & Experiences*, Chicago & Virtual, United States, October 2021.