Concurrent ABS with STM

A functional approach

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ABSTRACT

TODO: select journals - ACM Transactions on Modeling and Computer Simulation (TOMACS): https://tomacs.acm.org/ - ?

KEYWORDS

Agent-Based Simulation, Software Transactional Memory, Functional Reactive Programming, Haskell

ACM Reference Format:
Jonathan Thaler and Thorsten Altenkirch. 2019. Concurrent ABS with STM: A functional approach. In *Proceedings of International Symposium on Implementation and Application of Functional Languages (IFL'18).* ACM, New York, NY, USA, 1 page. https://doi.org/10.1145/nnnnnnn.nnnnnnn

1 INTRODUCTION

novelty in our case the use of FRP

We present case-studies in which we employ the well known SugarScape [1] and agent-based SIR [2] model to test our hypothesis. The former model can be seen as one of the most influential exploratory models in ABS which laid the foundations of object-oriented implementation of agent-based models. The latter one is an easy-to-understand explanatory model which has the advantage that it has an analytical theory behind it which can be used for verification and validation.

The aim of this paper is:

This paper makes the following contributions: - FRP and STM - compares 3 approaches: non-concurrent, low-level locking, STM

The structure of the paper is:

2 BACKGROUND

3 RELATED WORK

TODO: hlogo masterthesis TODO: erlang papers

4 CASE STUDY 1: SIR

- maps nicely to continuous time-semantics and state-transitions provided by FRP - STM results in considerable performance boost

5 CASE STUDY 2: SUGARSCAPE

- main difficulty: synchronous agent-interactions - STM: not clear yet but retry factor of 5

6 DISCUSSION

7 CONCLUSION

8 FURTHER RESEARCH

going towards distribution using Cloud haskell.

ACKNOWLEDGMENTS

The authors would like to thank

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[2] Charles M. Macal. 2010. To Agent-based Simulation from System Dynamics. In *Proceedings of the Winter Simulation Conference (WSC '10).* Winter Simulation Conference, Baltimore, Maryland, 371–382. http://dl.acm.org/citation.cfm?id=2433508.2433551

Received May 2018

IFL'18, August 2019, Lowell, MA, USA
2019. ACM ISBN 978-x-xxxx-xxxx-x/YY/MM…$15.00
https://doi.org/10.1145/nnnnnnn.nnnnnnn