Reactive Agents:
Functional Reactive Programming and ABM/S

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Abstract

In our previous work on update-strategies in Agent-Based Modelling & Simulation (ABM/S) we showed that Haskell is a very attractive alternative to existing object-oriented approaches but our presented approach was too limited and we hypothesized that embedding it within a functional reactive framework like Yampa would leverage it to be able to build much more complex models. In this paper we investigate whether this hypothesis is true by testing if our approach can easily be transferred to Yampa, what we really gain from it and if more complex models can become reality. As a proof-of-concept we build a large, complex model from Agent-Based Computational Economics (ACE) which simulates the NASDAQ stock market.

1 Introduction

TODO: select a suitable model simulating an economy
As example we select the Agent-Based Model from the Book [**?**] which is a model of the NASDAQ market from the year around 2001. Although the market itself has changed considerately some fundamentals are still in place and haven't changed. Our goal is to see whether we can rebuild this complex model with heterogenous Agents using Yampa in Haskell.

2 Related Research

3 Problem

4 FRP and Yampa

2 Pages

5 Results

5 Pages

6 Conclusion

7 Further Research

7.1 Updated Model

The next steps would then be to update the model to reflect the current details of the NASDAQ stock-market.

7.2 Batch Auctions

The paper [?] looked into utilizing batch-auctions as a remedy against High-Frequency-Trading and shows that it does work analytically. Although there exists an ABS (TODO: Wah, Elaine, and Michael Wellman. 2013. “Latency Arbitrage, Market Fragmentation, and Efficiency: A Two-Market Model.” 14th ACM Conference on Electronic Commerce, June.) it is more theoretical and it would be interesting to see how one could incorporate this extension in this more realistic framework.

References