Our paper experimentally investigates the benefit of using Software Transactional Memory (STM) over lock-based approaches to implement concurrent Agent-Based Simulations (ABS) using two case studies. Our contribution is that to the best of our knowledge we are the first to systematically investigate the use of STM in ABS and compare its performance with sequential, lock-based and imperative implementations both on local and Amazon Cloud Service machinery.

Our work is **Application driven research**. It reveals limitations of current methods (lock-based concurrent implementations) and propelling thus new methodological developments in modelling and simulation (use of Software Transactional Memory). We place our work in the following charters:
Model Execution: The paper focuses primarily on parallel/concurrent model execution by proposing STM over lock-based approaches to implement ABS.
I**nterplay between other areas of computer science and simulation**: We also ran our experiments on Amazon EC2 services thus we touch also on cloud computing and big data.

Our study relates to [1], where the author investigates Haskells' parallel and concurrency features to implement (amongst others) HLogo, a Haskell clone of the NetLogo [29] simulation package, focusing on using STM for a limited form of agent-interactions. Also our work relates to [2] where the authors discuss a framework, which allows to map Agent-Based Simulations to Graphics Processing Units (GPU). Our work also relates to [3, 4, 5] who are using the functional programming language Erlang to implement concurrent ABS, building on the Actor Model.

We propose the following Associate Editors to handle our manuscript:

- Wenton Cai
- Georgios K. Theodoropoulos
- Claudia Szabo

Further we recommend the following reviewers for our paper:

- Nikolas Bezirgiannsi https://www.cwi.nl/people/nikolaos-bezirgiannis
- Jonathan Ozik https://www.ci.uchicago.edu/profile/285
- Mikola Lysenko http://mikolalysenko.github.io/resume.html
- Roshan D'Souza https://uwm.edu/engineering/people/dsouza-ph-d-roshan/

We didn't submit our work to any Special Issue, thus no additional information is added.

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