LEDGER
ledgerjournal.org

ISSN 2379-5980 (online)
associated article DOI
10.5915/LEDGER.2019.175

Robotchain: Using Tezos Technology for Robot Event Management: Open Review

Authors: Miguel Fernandes,[†] Luís A. Alexandre[‡]

Reviewers: Reviewer A, Reviewer B

Abstract. The final version of the paper "Robotchain: Using Tezos Technology for Robot Event Management" can be found in Ledger Vol. 4, S1 (2019) 32-41, DOI 10.5915/LEDGER.2019.175. There were two reviewers involved in the review process, none of whom have requested to waive their anonymity at present, and are thus listed as Reviewers A and B. After initial review (1A), the editors requested that the authors respond to the reviewer concerns and make revisions (1B), which were carried out by the authors, completing the peer-review process.

1A. Review

Reviewer A:

The paper presents a method to improve factory productivity and accountability by introducing blockchain technology (Tezos) with robotic devices. The paper presents early results of the proposed platform.

Even though the paper is relevant for this symposium it needs significant changes to reach publication quality. In the following lines, I will describe the proposed changes in order of appearance in the text:

- Title -> Please use acknowledgement section in order to introduce the sponsors and funders of this research.

- Introduction (Page 1) -> Please introduce a clear comparison between your proposed solution and current factory control. It is important that you introduce the pros/cons of your solutions based on the current standards (with references of course).

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- Introduction (Page 2) -> access -> assess?

- Introduction (Page 2, first paragraph) -> Please provide a real-world example of the arguments you outline. You need to back up your arguments with real needs from the industry. For instance, did robot manufacturers find themselves in a situation where factory owners "filtered" sensitive data from the robots?

- Related Work (Page 2) -> I would reorganize this section in a chronological order. Besides introducing who presented what, I would introduce the main ideas and innovations that each paper presents. Finally, I would emphasize how your work is different from all those ideas presented previously.

- Our proposal (3.1 - The goals) -> What is the current solution for the problem you describe? How do factories ... "track every single action performed by every robot, in order to understand where possible bottlenecks are present?" Present this and defend your ideas in comparison to the current standards.

- Our proposal (3.2 Using Tezos) -> Again your need to clearly explain what does Tezos provide in comparison to more "mainstream protocols" for creating private blockchains (e.g., Ethereum). Is it speed of transactions, volume of transactions, etc.? This should correlate to the your results and claims in the results and conclusion sections ...

- Experiments (4.1 Experiment Setup) -> "For performance measurements, several metrics were chosen ..." You need to justify why these metrics are important factors for the adoption of this technology in your target application.

- Experiments (4.2 Trial Description) -> There should be a figure explaining the node initialization/connection process.

- Experiments (4.3 Results) -> This should be a section (5) by itself. Here you should only list the results of your experiments (the tables and Fig. 2). Create a new section (6 - Discussion), where you discuss these results. In there you should clearly include two things: 1) What are your systems design conclusions. For instance, is it better to have a 4/8 block cycle configuration given a certain amount of nodes? 2) Can you prove your hypothesis (the number of time out transactions depend on the computational capabilities of your experimental setup -- 4 threads) by conducting more experiments?

Reviewer B:

This paper presents a framework to use blockchain technology for robots. The paper relies on Tezos (an existing framework) and provides experimental results. The related works and method could be expanded. The major contribution is an experimental validation.

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1B. Authors' Response

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- There are no clearly established ways to perform what we propose with our system. The idea that all actions of robots in a factory are recorded in a way that makes it available for all interested parties to access but without the possibility of changing the collected information can only be achieved using blockchain technology. Also, we are trying to improve the speed of a blockchain solution such that it can register information from many robots. So it is not feasible to compare the proposal with current similar solutions since what can be achieved currently is the simple registration of these events into a database. This can be easily tampered with, unlike our proposal.

- Even so, we now include in the text two references for systems that can be used to monitor factory production, but that cannot provide the functionality of our proposal.

Reviewer B:

This paper presents a framework to use blockchain technology for robots. The paper relies on Tezos (an existing framework) and provides experimental results. The related works and method could be expanded. The major contribution is an experimental validation.

- Further explanations related to the execution process were added. Additions were made to the related work section regarding projects related to robotics and blockchain.

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