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Non-Fungible Programs: Private Full-Stack Applications for Web3: Open Review

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Reviewers: Reviewer A, Reviewer B

Abstract. The final version of the paper "Non-Fungible Programs: Private Full-Stack Applicatons for Web3" can be found in Ledger Vol. 10 (2025) 95-112, DOI 10.5195/LEDGER.2025.406. There were two reviewers involved in the review process, neither of whom has requested to waive their anonymity at present, and are thus listed as Reviewers A and B. After initial review by Reviewers A and B, the submission was returned to the authors with minor feedback for revision (1A). The authors resubmitted their work, the editors determined the revisions sufficient, and the paper was subsequently accepted for publication, thus ending the peer review process.

1A. First Round of Review

Reviewer A

Does this paper represent a novel contribution to cryptocurrency or blockchain scholarship?

Yes, important contribution(s)

Please briefly explain why you think the paper makes or does not make a novel contribution.

I like the novel idea of hosting in SVG, despite security risks as the authors cite in their paper. This can make applications portable and truly decentralized, the way you are bringing multiple elements into one unified framework are really cool. True ownership of software is key here, and the github code explains a lot.

Please provide your free-form review for the author in this section.

It's a good paper. The strengths are that you have a clear working prototype and clearly explain everything. My big concern is security, which you also mention in the paper,

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which is much needed in this space.

One of the interesting things you can focus on more is censorship resistance, as I think the true value of this technology is there. With current dApps, you still need a server to host the assets or use IPFS, which can still be blacklisted if required, but this approach is truly censorship resistance, which also brings a lot of ethical questions into light as well. All things you can focus on in the future.

Overall, it is a great paper, and I look forward to seeing what you all do with this technology and platform

Reviewer B

Does this paper represent a novel contribution to cryptocurrency or blockchain scholarship?

Yes, incremental contribution(s)

Please briefly explain why you think the paper makes or does not make a novel contribution.

The concept of NFPs represents a significant evolution in the development of decentralized applications (dApps), securing access to private data and functionalities regarding to the code and libraries of Dapps; Hostless frontend joined to a confidential smart contract backend

Please provide your free-form review for the author in this section.

Excellent (the motivation for the work is clear, the prose is fluid and correct grammar is used, the main ideas are communicated concisely, and highly-technical details are relegated to appendixes).

The article introduces the innovative concept of Non-Fungible Programs (NFPs), which integrates non-fungible tokens (NFTs) with decentralized application (DApp) development. The use of confidential smart contracts is a crucial feature that effectively enhances data privacy, addressing the issue of transparency in public blockchains. The elimination of the need for a persistent host significantly improves decentralization and user experience. However, the authors could enhance the related work section by discussing alternative solutions, such as deploying DApps on IPFS.

Strengths

Clear and Structured Writing: The article is well-structured, with clear and fluid writing that effectively guides the reader through the evolution of Web3 and smart contracts. The parallelism between Web2 and Web3 helps readers understand the core issues and the

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proposed solutions.

Comprehensive Problem Description: The authors clearly define the problem they aim to solve, which is crucial for understanding the significance of their contribution.
Innovative Proof of Concept: The implementation of a real-world interactive Bayesian game serves as an excellent proof of concept, demonstrating the model's applicability and potential for user engagement.

Community Support through SDK: The provision of an SDK for building NFPs encourages community involvement and supports further development and experimentation within the NFP framework.

Areas for Improvement

Related Work: The authors should explore whether other blockchains, such as NEAR Protocol, allow the deployment of large files or offer similar solutions. This would provide a more comprehensive context for the novelty of NFPs.

Figure Alignment: Figure 1 should be reviewed to improve its alignment with the text or to better specify its relevance to the body content.

Testing and Code Insights: The article would benefit from additional tests and deeper insights into the code implementation. This would provide readers and developers with a clearer understanding of the framework’s functionality and potential limitations.

Conclusion

Overall, the article presents a novel and valuable contribution to the field of Web3 applications, particularly through the NFP model. The research has the potential to be a significant resource for developers and researchers aiming to improve privacy and decentralization in application development. By enhancing the related work section, refining the visual presentation, and providing more technical details, the article could further solidify its impact on the field.

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