

Non-fungible tokens (NFT): a safe and effective way to prevent plagiarism in scientific publishing

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Introduction

Plagiarism and non-fungible token

Researchers make huge strides in advancing essential knowledge. Those achievements can save lives, change the way we understand the world and improve our quality of life. When a researcher is ready to share this knowledge, they prepare an academic publication like a journal article, proceedings paper or book chapter (Murziqin *et al.*, 2020). The long process of creating and disseminating new knowledge has reached its end and recognition through reads and citations will follow or so the researcher thinks. Plagiarism, copying, theft of findings are real risks that rob the researcher of their deserved credit. Over the years, laws and methods have been established to prevent this from happening, which were somewhat successful, but these research misconduct issues still exist, and each year a large number of researchers' scientific findings are used immorally (Maurer *et al.*, 2006).

Using new technologies, these issues may be abated. New digital technologies, such as blockchain and its unique product and non-fungible token (NFT), can offer a different solution for publishing digital files (Dowling, 2021). The NFT, a digital asset that cannot be reproduced, is a form of cryptography based on blockchain technology (Wang *et al.*, 2021). In recent years, the market for NFTs has grown rapidly. It was originally developed as a token standard for Ethereum, aiming to distinguish tokens with distinctive signs (Dowling, 2021). This type of token can be bound with virtual/digital properties as their unique identifications (Hong *et al.*, 2019). With NFTs, all marked properties can be freely traded with customized values according to their ages, rarity, liquidity, etc. (Dowling, 2021).

Probabilities considered: non-fungible tokens in other areas

Non-fungibility renders each object as a unique asset, which means that the originally produced object – in this case, a scholarly article and its content – is protected as a unique asset, even if it has not yet been published in a journal. This feature has caused researchers and experts to seek solutions for the use and introduction of NFT technology in their respective fields. One of the most tangible applications of NFT can be found in the world of art (Franceschet *et al.*, 2021; Kugler, 2021). With digital art, artists and creators are able to transform their digital artworks into unique assets that can be bought, sold and traded with effective ownership transfers (Kugler, 2021). Using cryptographic keys, each tokenized artwork is created directly by the artist. The work can be downloaded by anyone, but without owning the corresponding NFTs, it cannot be owned or acquired. As a result, ownership of the work is always reserved (Kugler, 2021). Currently, NFT is being studied by researchers in many fields. The field in which NFT has been most studied and paid attention to is the field of the digital economy (Hofstetter *et al.*, 2022). The reason for this is well known because the importance of protecting financial and monetary capital is very important. It should be noted, however, that the protection of assets such as the scientific findings of a researcher in the form of a digital object (text, audio, photo or video) will have spiritual and material importance, so pay attention to the high-level protection of these resources. As a result of the studies conducted so far on NFT technology for its introduction and use in various fields, it can be concluded that each of these fields emphasizes the importance of NFT's non-fungible

features (Dowling, 2021; Wang *et al.*, 2021; Hong *et al.*, 2019; Franceschet *et al.*, 2021; Kugler, 2021; Hofstetter *et al.*, 2022). Paying attention to the issue that valuable digital objects can be made non-fungible using NFT increases the security of a digital object, an issue that will definitely affect the future of most professions.

New possibility

Non-fungible token technology may be used to reduce plagiarism

Digital objects such as real images that are taken with a camera or graphic images that are created with the help of software, the text of a book that has been written (poem or novel), a sheet of a page that has been scanned and has the ability to be digital and/or the musical work that was created and stored on a platform, all of them can be a non-fungible work. Of course, this characteristic of being non-fungible is a personal matter and the individual himself decides whether to convert his work into a non-fungible object or not. The decision to be non-fungible can also be true for scientific writing and scientific findings. Imagine that the scientific findings of a study that the author recognizes make them a non-fungible property. It can be said with this method that the uniqueness, non-fungible and non-stealing characteristics of the author's scientific findings will be guaranteed.

Currently, digital object identifiers (DOI) are used to identify academic, professional and government information such as journal articles, research reports, data sets and official publications (Liu, 2021). A DOI is a fixed identifier or category used to uniquely identify various objects, developed by the International Organization for Standardization (Liu, 2021). With DOI, you can identify and record an object (e.g. an article) as a first-class entity, with a unique code that will

never change (Prodi and Out, 2022). Uniform resource identifiers (URL) are commonly used in DOI metadata to describe objects (Liu, 2021). In this case, why do we need NFT? There is probably a question in your mind about this. We need to understand how NFT works to answer this question.

Essentially, NFTs are created through a blockchain-based process called minting. The minting process involves creating a new block, verifying the NFT information with a validator and recording the information. In this process, intelligent metadata is often incorporated that assigns ownership and manages the transferability of NFTs (Dowling, 2021; Wang et al., 2021; Shaarma, 2022). As a result of this brief overview of how NFT works, two of its most important features, that is, the use of blockchain and intelligent metadata, are very important, because identification like DOI does not use blockchain or intelligent metadata. Certainly, with blockchain, NFT creates a more secure platform and provides more ownership details on the intelligent metadata than other identifier codes (such as DOI and URL).

Another thing that can be noted is that, unlike the DOI that is given to an entire document, NFT can be given to any part of the article that the author wants, for example, one NFT to figures, one to the statistical data and one to the main findings. It is very attractive and interesting to imagine that a publisher can offer an author's scientific article with the author's personal signature as intelligent metadata or any special proprietary feature such as a password or a logo.

Conclusion

From this paper, we can conclude that by using NFT technology to prevent plagiarism, both publishers and authors (researchers) will benefit. Large publishers can use NFTs as a basis for a new structure

in the publication of scientific findings and results. With this new structure, scientists could create unique scientific discoveries and prevent their own findings from being stolen.

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