

NFT Sales Price Prediction Using Visual Feature Extraction

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Abstract—Non Fungible Tokens (NFTs) are one-of-a-kind digital products that contain visual and audio-based static or continuous content. Their uniqueness ensured by the blockchain architecture enables trading of these assets and represents new generation ownership for them. NFT sales volume reached more than 2.5 billion USD¹ in the first half of 2021. Art, in-game items, collectibles, and music can be stored on NFTs. The availability of underlying decentralized networks enables open access to this content and further analyses. In the scope of this study, NFTs and their digital content will be analyzed via Convolutional Neural Networks to conduct predictions about future sales of these items. Creator, trader, marketplace, and domain-based information will be combined to make successful predictions among visual feature extraction approaches.

I. PROPOSAL

Non Fungible Tokens (NFTs) are blockchain-based digital assets that can store images, gifs, audios, videos, or any sort of data-based storable content. These assets can belong to different asset classes such as art, in-game items, or units of entertainment collections. What makes them attractive is their uniqueness, in a way that each NFT is exclusive to itself, and ownership is designated via digital certificates that belong solely to its owner. Most of the current attention in the NFT space is towards art though it's not limited to. Assets are traded in online marketplaces where intelligence on types of NFTs and the quantity of NFTs being sold are restricted mainly to top chart statistics. Traders, creators, and assets represent a comprehensive set of hidden insights with their actions and content produced.

NFT sales are shaped by several factors [1], including but not limited to visual content, trader behavior, and creator reputation. Due to the considerably immature state of the market and its dependence on visual features, it's possible to extract unit assets, creators, and trader-based

intelligence to predict future transactions. Considering the interdisciplinary nature of the NFT space, sales can be related to visual recognition-based decision making, behavioral finance, macroeconomic indicators' impact on individual sales, and total transactions. Prediction of future transactions or determination of critical factors making NFTs successful or not can propose a value, considering the volume of transactions. As the sole asset, visual features are mainly undiscovered. Visual content is stored on marketplaces and transaction hosting websites online. A marketplace focused on transactions is Opensea [2], which enables open API access for data retrieval with certain limitations. A recent study [1] is another potential source for data collection.

With the help of recent developments in the computer vision domain, visual features of NFTs can be discovered, and classification, clustering, or similarity ranking of these images can be conducted. In this project's scope, neural network architectures will be used to identify patterns of NFTs' visual content to understand what makes certain NFTs more valuable than the others via possibly excluding potential biases. Some biases can be the reputation of the artist, trader cluster habits, market manipulative initiatives, and NFT's story outside of its digital content. These can be impactful and distort outcomes, so they will be carefully analyzed and modeled with visual feature extraction. Convolutional neural networks (CNNs) [3] are forecasted to be the most suitable algorithms to conduct feature extraction and possibly image classification. Some of the most popular and widely adopted CNNs can be mentioned as AlexNET [4] and ResNET [5], which will be helpful in the scope of this project. Availability of these models as pre-trained and open source enables convenient application and benchmarking.

¹<https://www.reuters.com/technology/nft-sales-volume-surges-25-blm-2021-first-half-2021-07-05/>

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