

Resilience or Recession? A Longitudinal Analysis of NFT Market Dynamics and AI-Generated Value During the Crypto Downturn

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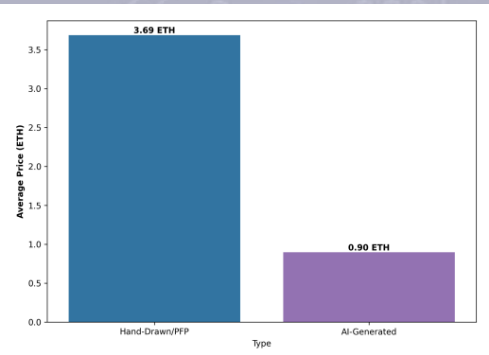
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Abstract

This study analyzes the non-fungible token (NFT) market during the 2024–2025 crypto downturn. We investigated whether AI-generated NFTs lost their premium compared to traditional collections and evaluated the reliability of machine learning models for price prediction in high-volatility environments. By analyzing over 113,000 transactions from 2024–2025 and comparing them to a 2023 baseline, we found a significant shift: AI assets traded at a 76% discount relative to traditional collections, completely reversing their previous premium. Furthermore, evaluating predictive models showed that Random Forest ($R^2=0.74$) outperformed Multi-Layer Perceptron ($R^2=0.71$) on the winter data, indicating that ensemble tree models are more robust than deep learning approaches in sparse, noisy financial environments.

Research method

Data Collection: Analyzed over 113,000 NFT transactions from the 2024–2025 period. Baseline Comparison: Compared findings against a massive 2023 baseline dataset containing nearly 7 million transactions. Comparative Analysis: Evaluated the price differences and trading behaviors between AI-generated NFT collections and traditional, hand-drawn collections. Predictive Modeling: Deployed and compared machine learning models, specifically Random Forest (RF) and Multi-Layer Perceptron (MLP), to predict NFT prices. Evaluated model robustness using the R^2 metric on the volatile dataset.



conclusion

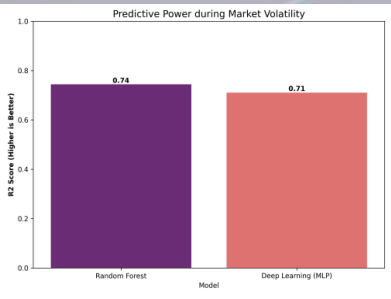
The 2024–2025 crypto downturn severely impacted the NFT ecosystem, causing a dramatic reversal in asset valuations. The initial market enthusiasm and premium for AI-generated art evaporated, resulting in a substantial discount compared to traditional collections. This suggests a “flight to quality” or a shift in collector preference toward human-created assets during market stress. Furthermore, in sparse and highly volatile financial environments, simpler ensemble tree models like Random Forest prove to be more robust and reliable for price prediction than complex deep learning architectures like MLPs.

The purpose of the research

- The primary objectives of this research are to investigate the dynamics of the NFT market during the “crypto winter” and to address the following key questions:
- To determine whether NFT trading volume collapsed alongside prices, or if liquidity demonstrated resilience.
- To analyze if the previously observed value premium for AI-generated NFTs persisted or reversed under bearish market conditions.
- To evaluate and compare the performance of predictive models, specifically assessing whether deep learning (MLP) outperforms ensemble tree models (Random Forest) for predicting NFT prices during high market volatility and sparsity.

Practical or simulation results

Market Dynamics: The market experienced a severe downturn, significantly impacting both pricing and trading behaviors compared to the 2023 baseline. Valuation Shift: AI-generated NFTs, which previously held a premium in 2023, suffered a massive devaluation, trading at approximately a 76% discount relative to traditional hand-drawn collections in the 2024–2025 period. Model Performance: In the highly volatile and noisy “crypto winter” environment, the Random Forest model demonstrated superior predictive capabilities over the deep learning model. Random Forest (RF): $R^2=0.74$ Multi-Layer Perceptron (MLP): $R^2=0.71$



References

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