LSSVM *: A Liquidity Provision Protocol for NFTs

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Abstract

We introduce the LSSVM[1], a protocol for creating custom AMMs for NFTs. It's kind of like Uniswap v3, but for NFTs. Just give it a read, it's pretty short.

1 The Need for NFT Liquidity

People like trading. They'll trade anything. Seriously, build it, and they will come.

2 Fractionalization Is NOT All You Need

In the search to create more efficient markets for NFTs, fractionalization (i.e. turning 1 NFT into some number of fungible tokens) is now seen as the default solution. Pioneered by excellent protocols like Niftex, NFTX, and NFT20, this approach is now commonplace, used by Fractional, Alchemy, Spectre, Unicly, szns, Shoyu, and many others. However, NFT fractionalization is not sufficient to serve all of the NFT market's needs.

Many users desire to buy and sell whole quantities of NFTs. In these situations, the fractionalization step can be seen as merely a convoluted (and gas expensive!) way to get NFTs to play well with existing $x * y = k$ AMMs like Uniswap or Sushiswap. In other words, the fungibility is simply a hack to allow for interoperability existing pricing models.

Furthermore, for projects which wish to provide either constant buy pressure or sell pressure for their NFTs, providing liquidity on a normal $x * y = k$ AMM is not capital efficient. For example, if Cryptoskunks (a hypothetical NFT project) wishes to spend 10 ETH to buy back their NFTs at a fixed rate,

*Name likely not final

[1]Name possibly not final

current NFT liquidity solutions (using fractionalization protocols and normal AMMs) would require them to deposit *both* ETH and the fractionalized NFT in order to allow for buybacks. But why should they have to commit anything else besides ETH if their goal is to use ETH for buybacks?

This motivates the search for other AMM designs which can allow for single (or lopsided) deposits of either ETH and/or the underlying NFTs.

3 Enter LSSVM [2]

LSSVM[3] is not a single AMM for NFTs, but, rather, a protocol for creating NFT AMMs that can respond to buy/sell pressure in a variety of customized ways.

Instead of dealing with fungible amounts of NFTs, LSSVM[4] requires traders to exchange whole numbers of NFTs. Instead of the typical $x * y = k$ bonding curve, we allow for arbitrary bonding curves. Because trades are now done in discrete amounts of NFTs, this greatly simplifies the calculation needed for many custom pricing models.

Rather than having liquidity providers deposit into the same AMM pool, LSSVM[5] creates individual ETH/NFT pairs for each depositor. By handling ETH and NFTs natively, we can provide a gas-optimized swapping and liquidity provisioning experience. Each liquidity provider can set their own custom bonding curve and swap fees. For more liquid pools (e.g. when projects themselves provide ETH and/or NFTs to allow for trading), end users can swap with the pair directly. In cases where there are more individual markets, aggregators can show the best current buy/sell price.

One possible question readers may have about the LSSVM[6] model is if it encourages liquidity fragmentation. In short, it may, but we think this won't be necessarily negative. Liquidity fragmentation is often problematic when it leads to higher slippage for buys or sells. But if LPs can set custom price curves (e.g. the most illustrative example is if the LP lists all NFTs at the same fixed price), then this can partially mitigate the issue.

With custom price curves, there are several exciting ways that LSSVM[7] can bring more nuanced automatic NFT price discovery to the market. One such example is having prices automatically rise or fall depending on demand, similar

[2] Name probably not final
[3] Name perhaps not final
[4] Name perchance not final
[5] Name unlikely to be final
[6] Name yet to be final
[7] Name probabilistically not final

to a Balancer LBP.

We see LSSVM[8] as a hybrid between the existing AMM models utilized by fractionalization protocols and the order book model utilized by OpenSea and others. For projects that want to buy or sell large amounts of NFTs in a programmatic way, it provides a more capital efficient method compared to existing AMMs.

4 LSSVM[9] Is NOT All You Need

Of course, LSSVM[10] doesn't solve the entire NFT liquidity problem. For one, it still assumes homegenity between NFTs, which makes value differentiation for sub-classes difficult. Note that this is somewhat alleviated by the separate pools; someone could, for example, create a custom curve for green Cryptoskunks only.

Separately, by avoiding fractionalization, LSSVM[11] makes itself a less desirable choice for projects with very small supply. Protocols with buyout options can make holding fractional amounts less risky, and fractional tokens are also a powerful building block for products like NFT indices.

Although more capital efficient (depending on the choice of bonding curve) compared to the $x * y = k$ AMM, the LSSVM[12] model is still less gas-efficient than non-custodial off-chain order books, as in LSSVM[13] the assets have to be locked into the pair. Note, however, that this could actually be desirable in certain cases, e.g. if a project commits to transparently locking up X ETH for NFT buybacks at Y price.

5 When Token?

redacted.finance[14]

[8] Name hopefully to be final
[9] Name ideally to be not final
[10] Name is reaching finality
[11] Oh no, oh no, please
[12] Oh lord help me, there's one confirmation lef–
[13] FINALITY
[14] Reorg plz