Sentiment Fee Hook

Dynamic fees that adapt to market psychology

Dynamic Fee	Custom Hooks	Oracle	LP Fees	DEX

The Problem

Traditional AMMs use fixed fees that are suboptimal in all market conditions.

Bull Markets (Greed)

- Traders willingly pay more
- Fixed 0.3% fees leave money on table
- LPs miss potential revenue

Bear Markets (Fear)

- Fixed fees kill trading volume
- Traders avoid the exchange
- LPs earn nothing

Our Solution

Counter-cyclical dynamic fees based on real-time market sentiment

Extreme Fear (0)	**0.25% fee**

Neutral (50)	**0.345% fee**

Extreme Greed (100)	**0.44% fee**

Maximizes fee x volume across all market cycles

Architecture

Off-Chain: Keeper Bot

- Aggregates 8 free data sources
- Weighted sentiment scoring
- Updates every 4 hours
- $0/month data costs

On-Chain: Hook Contract

- Uniswap v4 beforeSwap hook
- EMA smoothing (anti-manipulation)
- Staleness protection (6hr fallback)
- Gas-efficient design

```
fee = MIN_FEE + (sentimentScore * FEE_RANGE / 100)
```

Sentiment Data Sources

8 free APIs aggregated with weighted scoring

- Fear & Greed Index (30%)

- CoinGecko Global (20%)

- CoinGecko Trending (10%)

- Bitcoin Dominance (10%)

- DeFi Llama TVL (10%)

- ETH Price Movement (10%)

- CryptoCompare Social (5%)

- Blockchain.com Stats (5%)

Security & Anti-Manipulation

EMA Smoothing

- 30% new / 70% historical data
- Prevents sudden fee manipulation
- Limits single-update impact

Anti-Frontrunning

- Randomized update timing
- +/- 30 min jitter on updates
- Unpredictable execution

- Staleness protection: Auto fallback to 0.30% after 6 hours

- Bounded fees: Always between 0.25% - 0.44%

- Multi-keeper support: Decentralized update authority

Tech Stack

50	8	$0
Test Cases	Data Sources	Monthly Cost

Solidity 0.8.26 | Foundry | Uniswap v4 | TypeScript | ethers.js | OpenZeppelin

Supports: Ethereum, Arbitrum, Base, Optimism, Polygon + Testnets

Decentralization Roadmap

v1 - Current (Implemented)

- Multi-keeper support (multiple authorized addresses)

- Randomized timing jitter (anti-frontrunning)

- EMA smoothing + staleness fallback

v1.5 - Short-term

- Chainlink Automation for reliable execution

- Multi-sig keeper (3-of-5 trusted updaters)

v2 - Medium-term

- Chainlink Functions for trustless off-chain compute

- Multiple independent data aggregators

v3 - Long-term

- Fully decentralized oracle network

- DAO governance for parameter updates

Quick Start

Run Tests

```
forge test
```

Local Demo

```
bash demo.sh
```

Deploy & Run Keeper

```
forge script script/DeployFullDemo.s.sol --broadcast
```

```
cd keeper && npx ts-node src/multi-source-keeper.ts
```

Thank You

Sentiment-Responsive Fee Hook for Uniswap v4

Dynamic fees that adapt to market psychology

Maximizing LP revenue across all market cycles

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