REPORT

Title: Web3 Trader Behavior Analysis: Hyperliquid vs. Bitcoin Sentiment

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Date: January 9, 2026

1. Introduction

This project analyzes how market sentiment (measured by the Bitcoin Fear & Greed Index) correlates with actual trading behavior on the Hyperliquid exchange. The objective is to identify if sentiment can serve as a predictor for trader profitability and risk appetite.

2. Methodology

- **Data Sources:** Two datasets were used: historical_data.csv (trader transactions) and fear_greed_index.csv (daily sentiment).
- **Data Integration:** Using Python and Pandas, the transaction timestamps were normalized to a daily format to allow for an inner join with the sentiment data.
- **Analysis:** I focused on two primary metrics: **Closed PnL** (to measure success) and **Size USD** (to measure risk/volume).

3. Key Insights

Profitability vs. Sentiment: According to `pnl_vs_sentiment.png`, traders were most profitable during Greed phases, averaging nearly $90 in Closed PnL. Interestingly, profitability dropped significantly during Extreme Greed, suggesting that traders who don't exit before the "peak" sentiment see their returns diminish.

Risk Appetite (Trade Size): Looking at `trade_size_vs_sentiment.png`, there is a clear trend of increasing risk as the market moves toward extremes. Average trade sizes peaked at over $5,500 during Extreme Greed, which is nearly double the average size during Neutral markets ($3,000). This indicates that traders are most aggressive when market hype is at its highest.

Activity & Frequency: The `trade_frequency_pie.png` reveals a massive imbalance in trader activity. A staggering 72.7% of all trades occurred during Fear periods. This suggests that while trade sizes are smaller during Fear, the high frequency indicates high-volume "panic" trading or accumulation behavior.

4. Conclusion

The data suggests that traders on Hyperliquid tend to **i**ncrease their exposure significantly as market optimism peaks, which leads to diminishing returns during "Extreme Greed" despite taking on much larger risks. While the majority of trade activity (over 72%) occurs during "Fear" periods, the most aggressive capital allocation happens during periods of euphoria. A recommended strategy would be to move against the crowd during "Extreme" sentiment readings, as the data indicates a disconnect between high risk (trade size) and actual realized profit.

Final Strategy Recommendation

Based on these insights, the most effective strategy would be a Contrarian approach with controlled sizing. While Greed is profitable, the sharp rise in trade size during Extreme Greed combined with falling PnL suggests a "trap" where traders overextend right before a reversal. I recommend reducing position sizes by 50% when sentiment enters the Extreme Greed category to preserve capital.