Trader Behavior & Market Sentiment Analysis

Objective

Analyze how Bitcoin market sentiment (Fear/Greed) influences trader performance on Hyperliquid and identify behavioral patterns that can guide smarter trading strategies.

Project Overview

This project integrates two datasets:
• **Bitcoin Market Sentiment (Fear/Greed Index)**
• **Hyperliquid Historical Trader Data**

The goal was to clean, merge, analyze, and extract actionable insights connecting sentiment with real trading behavior.

Work Approach

Step 1: Understanding the Datasets
- Reviewed sentiment dataset (Date, Classification, Value)
- Reviewed trader dataset (account, symbol, size, side, timestamps, closedPnL)

Step 2: Cleaning Sentiment Dataset
- Converted dates to datetime
- Normalized timestamps
- Cleaned sentiment labels (Fear/Greed)

Step 3: Cleaning Trader Dataset
- Timestamps were in DD-MM-YYYY HH:MM format; required manual parsing
- Converted numeric columns (closedPnL, size_usd, fee)
- Extracted trade date and hour

Step 4: Merging Datasets
- Merged on normalized dates
- Addressed timezone & date mismatch

Final result: Sentiment successfully mapped for all overlapping dates.

Problems Faced & Solutions

1. Timestamp mismatch
Issue: Merge failed due to datetime64 vs object mismatch.
Solution: Normalized both to datetime64[ns].

2. All trade dates parsed as NaN
Issue: Wrong timestamp format.
Solution: Used format='%d-%m-%Y %H:%M' with fallback parsing.

3. Limited date overlap
Sentiment dataset contains 1414 unique dates, trader dataset ~480, overlap 284.

4. Git issues (tracked env folder, push errors)
Resolved using .gitignore, rm cached, PAT authentication.

Key Insights

• Win-rate in **Fear**: 42.01%
• Win-rate in **Greed**: 38.42%
• Average PnL higher during Fear
• Larger positions in Fear (disciplined setups)
• Greed → impulsive trading & lower-quality decisions
• Trader archetypes identified:
  - Whale (High conviction)
  - Consistent Performer (Stable returns)
  - Grinder (High-frequency small trades)
• Symbol-level & hour-of-day patterns discovered

Strategic Recommendations

• Reduce leverage & size during Greed periods
• Use larger positions selectively during Fear
• Incorporate sentiment filters into strategy engines
• Design trader-type-specific models
• Avoid weak trading hours during Greed states

Conclusion

Sentiment significantly influences trader behavior. Fear environments produce disciplined, profitable trading, while Greed increases noise, risk-taking, and poor decisions. Incorporating sentiment into trading systems improves performance, risk control, and consistency.

Prepared By

Harshith