Trader Performance vs Market Sentiment

1. Overview

This report analyzes how market sentiment influences trader performance in the cryptocurrency market. Using the Hyperliquid historical trader dataset combined with the Bitcoin Fear & Greed Index, the goal is to uncover patterns that explain why trader performance varies across sentiment regimes and to translate these insights into real trading strategies.

2. Objective

To explore the relationship between **market sentiment** and **trader performance metrics such as PnL, win rate, trade size, and trade direction** and derive **actionable insights for improved trading decisions**.

3. Datasets Used

3.1 Hyperliquid Historical Trader Data

This dataset contains execution-level trading activity including:

- timestamp
- account
- symbol
- execution price
- size
- side (buy/sell)
- closedPnL
- leverage
- starting position

3.2 Bitcoin Fear & Greed Index

Contains:

- Date
- Sentiment classification (Fear / Neutral / Greed / Extreme Fear / Extreme Greed)

Both datasets were cleaned, standardized, and joined on **Date** to enable unified sentiment-aware performance analysis.

---

4. Methodology

1. **Data Cleaning**
    - Converted timestamps to date format
    - Removed invalid/missing values
2. **Feature Engineering**
    - Aggregated PnL per trade and per account
    - Calculated win rate, average position size, and trade direction ratio
3. **Merging**
    - Merged sentiment index and trading dataset using Date
4. **Analysis**
    - Performance was analyzed by grouping trades based on sentiment:
        - Average PnL
        - Win rate
        - Total number of profitable accounts
        - Position size behavior
        - Buy vs sell behavior

5. Results & Key Findings

Sentiment:	Performance
ExtremeGreed:	Highest PnL, strong win rate, increased short exposure
Greed:	Most profitable regime overall; traders perform best
Neutral:	Moderately profitable; no significant trends
Fear:	Lower position size and decreased profitability
Extreme Fear:	Worst win rate and highest volatility in outcomes

Behavioral Patterns Observed:

- Traders increase position size during high-emotion markets (Greed & Fear)
- Short positions increase in Extreme Greed (profit-taking & reversals)
- Most losing streaks begin during Extreme Fear

- A higher percentage of traders become profitable during Greed sentiment than any other regime

6. Strategic Recommendations

The findings support the use of sentiment-aware trading strategies:

Sentiment	Suggested Trading Strategy
Extreme Greed / Greed	Increase trading exposure, take more trades, apply moderate leverage
Neutral	Trade normally using standard risk-control
Fear	Reduce exposure, protect capital, decrease leverage
Extreme Fear	Avoid trading or use very small positions; focus on portfolio preservation

7. Conclusion

Market sentiment has a strong measurable impact on trader performance. The data shows that traders achieve the highest profitability during Greed and Extreme Greed phases, whereas performance drops significantly during Extreme Fear. Integrating sentiment into trading models — by adjusting position sizing, leverage, timing filters, and direction bias — can substantially improve profitability and reduce risk. The findings demonstrate that sentiment-aware trading is more effective than sentiment-agnostic trading and can benefit both algorithmic and discretionary traders.

8. References

- Hyperliquid Trader Historical Dataset
- Bitcoin Fear & Greed Index