Final Report: Relationship Between Trader Performance and Market Sentiment

Introduction

The goal of this analysis is to understand how market sentiment (Fear vs. Greed) influences trader performance. We use two datasets: Bitcoin Market Sentiment (Fear/Greed Index) and Historical Trader Data (Hyperliquid).

Data Preparation

Timestamps were converted to datetime, dates extracted to align with sentiment index, datasets merged on date, and a target variable created (profitable = 1 if PnL > 0 else 0).

Exploratory Data Analysis

1. Market Sentiment Distribution: Balanced mix of Fear and Greed days.
2. Trader Performance: Average PnL and win rates were higher on Greed days.
3. Leverage Behavior: Higher leverage during Greed, more conservative during Fear.
4. Trade Size vs. PnL: Larger trades produced more extreme outcomes, amplified by sentiment.

Machine Learning Insights

A logistic regression model predicted profitability with ~65-70% accuracy.
Feature importance: Leverage > Sentiment > Trade Size > Side.
Greed days increased profit probability, leverage was the most influential variable.

Strategy Backtest

Two strategies were tested:
- Fear-only: Flat or declining performance.
- Greed-only: Positive upward trend and higher cumulative PnL.
Result: Greed-only strategy significantly outperformed Fear-only.

Conclusion

1. Greed days: Higher profitability, higher risk.
2. Fear days: Lower profitability, possible contrarian opportunities.
3. Leverage has the strongest influence.
4. Greed-only strategies outperform Fear-only.

Recommendations

- Implement stricter risk controls during Greed.
- Explore contrarian short strategies during Fear.
- Use Fear/Greed index as feature in systematic trading.
- Adjust leverage dynamically based on sentiment.