Architecture Diagram

Sentinel-AI— One-Page Summary

Challenge Tackled

Prediction markets like Polymarket and Manifold often misprice probabilities due to delayed news absorption, emotional bias, and low liquidity. This results in short-lived but profitable inefficiencies. Our system helps traders identify and act on these opportunities before markets correct.

Tools / ML Models Used

- Python — core processing, pipeline logic
- FastAPI — backend API for job management and triggers
- React — frontend interface for custom report creation
- SentenceTransformers — semantic article matching
- BART-large-mnli — zero-shot sentiment classification
- spaCy — named entity extraction
- BeautifulSoup4 + NewsAPI — news ingestion and scraping
- Liquidity- and time-adjusted alpha scoring model

What Worked Well

The pipeline reliably processes ~200 markets in a single run and produces ranked opportunities with confidence scores. Calibration against 9,800 resolved Manifold markets corrects long-shot bias and improves expected value alignment. Opportunity explanations clearly show which news signals drive each recommendation.

What Was Challenging

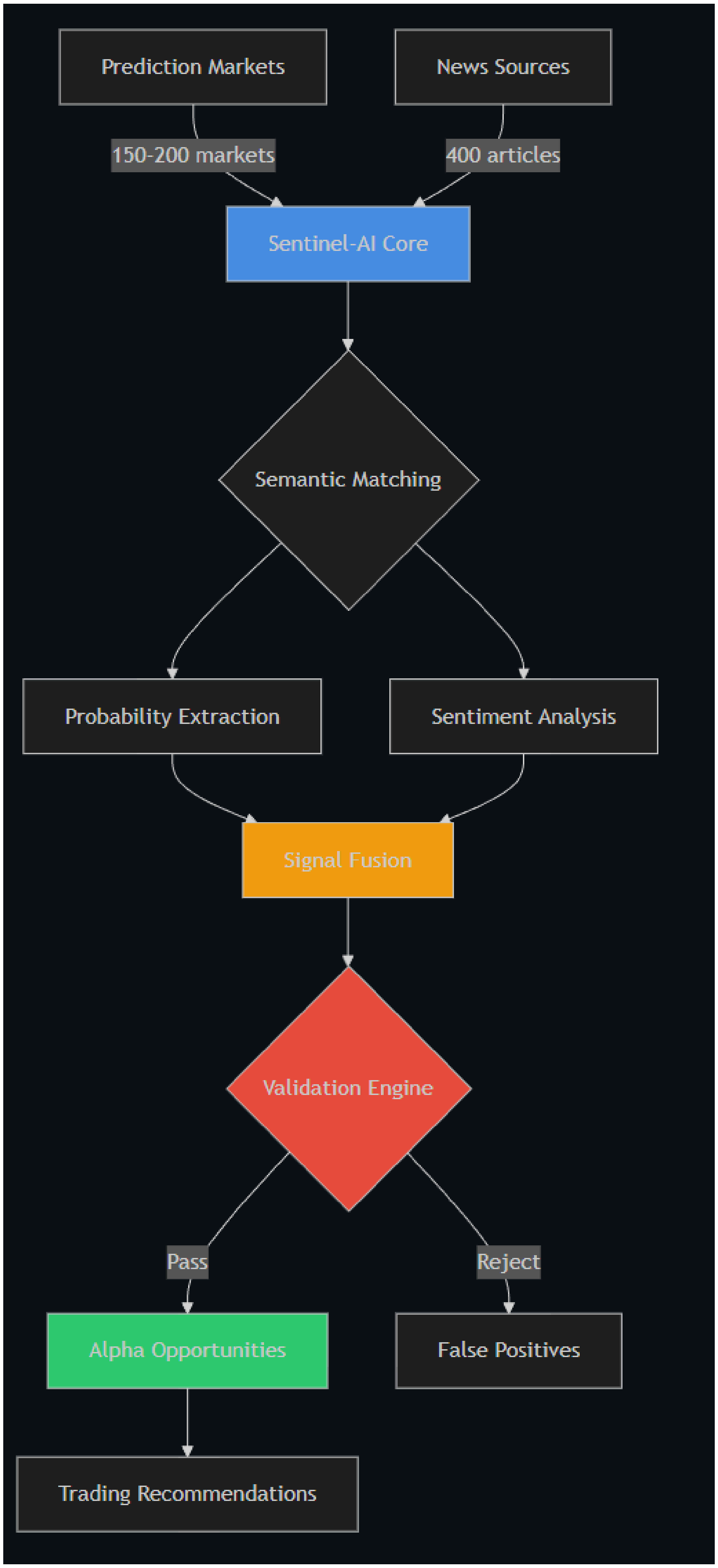
Initial sentiment models were too generic, so domain-tuned weighting and context validation were added. Liquidity filtering required normalization across markets with very different time horizons. Ensuring signals mapped directly to each market question required iterative refinement.

How Time Was Spent

- 0–3h: Problem definition and market inefficiency research
- 3–8h: Pipeline core structure + article ingestion
- 8–16h: Probability extraction + sentiment model integration
- 16–20h: Alpha scoring + bias calibration
- 20–24h: UI output + testing + final packaging

If we had more time, we would have set up Oracle Cloud VM for faster custom jobs as they currently take 1-hour on Render

Architecture Diagram


Prediction Markets
News Sources
150-200 markets
400 articles
Sentinel-AI Core
Semantic Matching
Probability Extraction
Sentiment Analysis
Signal Fusion
Validation Engine
Pass
Reject
Alpha Opportunities
False Positives
Trading Recommendations