

# Autonomous Trading Orchestration

Level 4 Learning System | CAPM-Integrated Risk | Multi-Agent Logic

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# The Intelligent Infrastructure

An autonomous digital workforce designed to bridge the gap between  
technical quantitative analysis and neural sentiment reasoning.

# A Multi-Agent Digital Workforce



## Screener Agent

Monitors 3,000+ assets for gaps > 2% and volume > 1.5x, detecting sector rotation movers in real-time.



## Research Agent

Leverages Exa Neural Search and GPT-4 to perform deep semantic analysis on macro catalysts and earnings news.



## Risk Agent

Enforces 15+ institutional guardrails and applies CAPM-based position scaling to protect total equity.

# Technicals + AI Sentiment Logic

## The Hybrid Decision Score

Unlike standard bots, our system fuses quantitative precision with qualitative reasoning:

- ✓ **Quantitative:** RSI, MACD, and Bollinger Bands provide multi-timeframe confirmation.
- ✓ **Qualitative:** GPT-4 scores 14 days of news sentiment from -1.0 to +1.0.
- ✓ **Composite:** Weights adapt based on the current market regime.



# Institutional Risk: CAPM Engine

## Mathematically Constrained Exposure

Every position is scaled using the Capital Asset Pricing Model (CAPM). The system automatically reduces exposure for high-beta stocks to maintain a low systematic risk profile.

$$E_R = R_f + \beta (R_m - R_f)$$

*Scaling Factor =  $1 / \beta$  (Capped at 2.0x for low-volatility stability).*



## Safety: 15+ Active Guardrails

**15+**  
PROTECTIVE RULES

### No Unprotected Orders

The system operates with a "Security-First" ethos. It will never submit an unprotected entry. Every trade is strictly bracketed with ATR-based stops and resistance-aware take-profits.

Guardrails include: Sector exposure caps (30%), single position limits (5%), and automatic halts if the daily drawdown exceeds 3%.

# Exposure by Market Regime



*The Meta-Agent automatically throttles the system's "Risk Appetite" based on VIX levels and market breadth metrics.*

# Accuracy & Growth Trends

Steady compounding through rigorous Bayesian optimization of indicator weights.



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# Level 4 Meta-Learning Cycles

-  **Daily Post-Mortem:** Every session ends with an Outcome Tracker audit, identifying why signals succeeded or failed.
-  **Bayesian Optimization:** Automatically fine-tunes Buy/Sell thresholds to minimize drawdown during regime transitions.
-  **Tri-Layer Memory:** System maintains short-term (trade context), medium-term (market), and long-term (strategy) memory banks.
-  **Pattern Discovery:** Learns stock-specific "personality traits" to adapt entry logic for mega-caps vs. mid-caps.

# Enterprise Technology Stack

Module	Technology	Strategic Value
Orchestration	LangGraph 0.2+	Persistent, state-aware agentic workflows.
Intelligence	OpenAI GPT-4o	Contextual reasoning and narrative scoring.
Market Data	Alpaca V2 API	Institutional-grade latency and order fills.
Backend	Azure Cloud	SQL Persistence and scalable Function APIs.

# LangGraph Orchestration Logic



## State-Driven Connectivity

The system utilizes **LangGraph** to move beyond simple linear scripts. This allows for complex branching—if the Risk Agent rejects a trade, the system "loops back" to the Signal Agent for recalibration. This architecture ensures that no decision is made in a vacuum, mirroring the collaborative process of an institutional trading desk.

# Questions?

Autonomous Trading Agent Showcase

LIVE DASHBOARD

[agenttrading.azurewebsites.net](http://agenttrading.azurewebsites.net)

# Image Sources



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