



# SignalStack

AI-Powered Autonomous Portfolio Manager on Crypto Rails

by CryptoRizz

# Problem Statement

## Manual Rebalancing Issues

Inefficient, emotional decisions cause errors and missed opportunities.

## Trust Deficit

DAOs and DeFi users lack trustless, intelligent managers on-chain.

## Limitations of Existing Bots

Often simplistic or opaque, lacking transparency and adaptability.

## Need for On-Chain Agents

Informed, autonomous agents to dynamically manage assets.



# Solution —

## AI Agent

Self-operating with smart decision logic for portfolio management.

## 4 Price-Action Indicators

- Mean Reversion
- Momentum
- Volatility
- Breakout

## Consensus & ML Model

Majority vote enhanced by trained machine learning for accuracy.

## On-Chain Execution

Rebalances triggered via smart contracts seamlessly on Ethereum.

# Core Features



## Price Signal Engine

Mean Reversion, Momentum, Volatility, Breakout Detection



## AI-Enhanced Model

LightGBM or Random Forest scoring for improved predictive accuracy.



## Smart Contract Integration

Token swaps via Uniswap and 0x protocols on Ethereum blockchain.



## User-Friendly

MetaMask integration ensures seamless user experience.



## Transparent Logs

Auditable on-chain events provide full trade transparency.

# Rebalancing Criteria

## Indicators

- Mean Reversion
- Momentum
- Volatility
- Breakout Detection

## Signal Sum →

- +3/+4: Strong Buy
- +1/+2: Mild Buy
- 0: Hold/Neutral
- -1/-2: Mild Sell
- -3/-4: Strong Sell

## Asset Selection &

- Top 5 cryptos by market cap/liquidity
- Signals summed → weights assigned and normalized
- Portfolio automatically rebalanced

# Architecture



## 1 Data Fetch

Oracles and APIs gather real-time pricing data.

## 2 Indicator Engine

Computes price signals based on multiple strategies.

## 3 ML Model

Predicts rebalance target weights with AI scoring.

## 4 Smart Contract

On-chain rebalancing and event logging for transparency.

## 5 User Interface

MetaMask frontend enables direct user interactions.



# AI/ML Component

## Dataset

Price data and indicators mapped to success outcome labels.

## Model

Phase 1 uses LightGBM classifier for rebalance success prediction.

## Functions

- Adapt signal weightings dynamically
- Enhance confidence in voting outcomes
- Minimize false trade executions

# Smart Contract & Web3

## Smart Contract

Solidity code handling on-chain rebalancing logic.

## Swap Protocols

Uses Uniswap V3 or 0x for efficient token swaps.

## User Interaction

MetaMask triggers trades; supports automation via Chainlink/Gelato.

## Transparency

All trades logged on-chain with event records for audit.



# Use Cases & Impact

## DAO Treasury

Automated trustless rebalancing for DAO assets.

## Yield Strategy

Manages and optimizes passive yield farming strategies.

## Passive Portfolio

User-friendly AI managing diversified crypto portfolios.

## DeFi Infrastructure

Composable primitive for building autonomous DeFi agents.



# Future Roadmap

## On-chain ML Inference

Deploy lightweight and zkML models for direct on-chain AI.

### DAO Governance

Enable community control over agent parameters and strategy.

### Reinforcement Learning

Adaptive market strategies improving with continuous learning.

### Multi-Agent Swarm

Optimize risk buckets through coordinated autonomous agents.