Open-Source GitHub Research for RISKCORE

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Focus: Portfolio risk management, VaR, IBOR, and hedge fund analytics

Executive Summary

Analysis of open-source projects on GitHub reveals a rich ecosystem of portfolio analytics and optimization tools, but no comprehensive multi-manager risk aggregation solution exists. Most projects focus on:

- Portfolio optimization (weights, efficient frontier)
- Performance analytics (returns, Sharpe, drawdowns)
- VaR calculation (single portfolio)
- Derivatives pricing

Key Gap: No open-source project addresses the multi-PM risk aggregation problem that RISKCORE targets.

Top Projects by Category

1. Portfolio Analytics & Performance

Project	Stars	Forks	Language	Last Active	License
[OpenBB](https://githu	31k+	3k+	Python	Active	AGPL-3.0
[pyfolio](https://gith	5.5k+	1.9k+	Python	Archived	Apache 2.0
[QuantStats](https://g	4.5k+	800+	Python	Active	Apache 2.0
[PyPortfolioOpt](https	4.5k+	1k+	Python	Active	MIT
[Riskfolio-Lib](https:	3k+	600+	Python	Active	BSD-3

Detailed Project Analysis

OpenBB (OpenBB-finance/OpenBB)

URL: https://github.com/OpenBB-finance/OpenBB

Stars: 31,000+ | Forks: 3,000+

Language: Python | License: AGPL-3.0

Status: Very Active (daily commits)

Overview

OpenBB is a financial data platform for analysts, quants, and AI agents. It's the most comprehensive open-source financial data infrastructure available.

Key Features

- Connects to 100+ data providers
- Covers equities, options, crypto, forex, macro, fixed income
- REST API via FastAPI
- Python SDK for quants
- MCP servers for AI agents
- Excel integration

Tech Stack

- Python 3.9-3.13
- FastAPI + Uvicorn
- Modular extension system
- 220+ contributors

What It Solves

- Data aggregation from multiple sources
- Unified API for financial data
- Research and analysis workflows

What's Missing (RISKCORE Opportunity)

- No position management
- No portfolio aggregation
- No risk calculations (VaR, Greeks)
- No multi-manager views
- Data-focused, not risk-focused

pyfolio (quantopian/pyfolio)

URL: https://github.com/quantopian/pyfolio

Stars: 5,500+ | Forks: 1,900+

Language: Python | License: Apache 2.0

Status: Archived (Quantopian shut down 2020)

Overview

Portfolio and risk analytics library developed by Quantopian. Creates comprehensive "tear sheets" for portfolio analysis.

Key Features

- Performance tear sheets with multiple plots
- Risk metrics (Sharpe, Sortino, drawdowns)
- Factor analysis and attribution
- Rolling volatility analysis
- Intraday strategy support
- Integration with Zipline backtester

Tech Stack

- Python, NumPy, Pandas
- Matplotlib for visualization
- empyrical for metrics

What It Solves

- Backtest analysis
- Strategy performance evaluation
- Risk/return profiling

What's Missing (RISKCORE Opportunity)

- No real-time capability
- No multi-portfolio aggregation
- No position-level data
- No VaR calculations
- Archived/unmaintained

QuantStats (ranaroussi/quantstats)

URL: https://github.com/ranaroussi/quantstats

Stars: 4,500+ | Forks: 800+

Language: Python | License: Apache 2.0

Status: Active

Overview

Portfolio profiling library providing in-depth analytics and risk metrics for quants and portfolio managers.

Key Features

- CVaR (Conditional Value at Risk)
- Monthly returns heatmaps
- Performance metrics
- HTML report generation
- Benchmark comparison

Tech Stack

- Python, Pandas, NumPy
- Matplotlib, Seaborn

What It Solves

- Portfolio performance reporting
- Risk metric calculations
- Visual analytics

What's Missing (RISKCORE Opportunity)

- Returns-focused, not position-focused
- No multi-portfolio support
- No real-time updates
- Limited risk measures

PyPortfolioOpt (robertmartin8/PyPortfolioOpt)

URL: https://github.com/robertmartin8/PyPortfolioOpt

Stars: 4,500+ | Forks: 1,000+

Language: Python | License: MIT

Status: Active

Overview

Comprehensive portfolio optimization library implementing classical and modern methods.

Key Features

- Mean-variance optimization (Markowitz)
- Black-Litterman allocation
- Hierarchical Risk Parity (HRP)
- Covariance shrinkage
- Long/short portfolios
- Market-neutral portfolios
- L2 regularization

Tech Stack

- Python, NumPy, Pandas
- SciPy for optimization
- cvxpy for convex optimization

What It Solves

- Portfolio weight optimization
- Risk-adjusted allocation
- Efficient frontier construction

What's Missing (RISKCORE Opportunity)

- Optimization only, no monitoring
- No real-time position tracking
- No multi-manager support
- No VaR or Greeks

Riskfolio-Lib (dcajasn/Riskfolio-Lib)

URL: https://github.com/dcajasn/Riskfolio-Lib

Stars: 3,000+ | Forks: 600+

Language: Python | License: BSD-3

Status: Very Active (version 7.0.1)

Overview

Comprehensive quantitative portfolio optimization library from Peru. Most feature-rich optimization library available.

Key Features

- 24 convex risk measures
- Mean-Risk optimization
- Kelly Criterion (log utility)
- Risk Parity
- HRP and HERC clustering
- Black-Litterman (multiple variants)
- CVaR, EVaR, RLVaR
- Drawdown-based measures (CDaR, EDaR)
- Tracking error constraints
- Turnover constraints

Tech Stack

- Python 3.9+
- CVXPY for optimization
- Pandas integration
- Optional: MOSEK, GUROBI solvers

What It Solves

- Advanced portfolio optimization
- Risk budgeting
- Factor-based allocation

What's Missing (RISKCORE Opportunity)

- Optimization-focused, not monitoring

- No position tracking
- No multi-portfolio aggregation
- No real-time capability

FinancePy (domokane/FinancePy)

URL: https://github.com/domokane/FinancePy

Stars: 2,600+ | Forks: 400+

Language: Python | License: MIT

Status: Active

Overview

Derivatives pricing and risk management library by EDHEC professor. C++-like performance via Numba.

Key Features

- Fixed income (bonds, swaps, swaptions)
- Equity derivatives (options, variance swaps)
- FX derivatives
- Credit derivatives (CDS, CDO)
- Interest rate models
- 60+ Jupyter notebooks

Tech Stack

- Python, NumPy, Numba
- SciPy

What It Solves

- Derivatives pricing
- Greeks calculation
- Curve construction
- Model calibration

What's Missing (RISKCORE Opportunity)

- Single instrument focus
- No portfolio aggregation
- No position management
- No multi-manager support

VaR Calculation Projects

ibaris/VaR

URL: https://github.com/ibaris/VaR

Stars: 100+ | Language: Python

Status: Maintained

Features

- Historical VaR
- Parametric VaR
- Monte Carlo VaR
- Parametric GARCH

- Expected Shortfall (CVaR)
- PELVE (Probability Equivalent Level)
- Backtesting routines

What's Missing

- Single portfolio only
- No real-time capability
- Limited aggregation

VaRCalculator (prudhvi-reddy-m)

URL: https://github.com/prudhvi-reddy-m/VaRCalculator

Stars: 50+ | Language: Python

Features

- Historical, Parametric, Monte Carlo methods
- Clean class-based API
- Educational focus

AI-Powered Hedge Fund Projects

AutoHedge (The-Swarm-Corporation)

URL: https://github.com/The-Swarm-Corporation/AutoHedge

Stars: 500+ | Language: Python

Status: Active

Features

- Multi-agent AI architecture
- Director, Quant, Risk, Execution agents
- Automated market analysis
- Trade execution

ai-hedge-fund (virattt)

URL: https://github.com/virattt/ai-hedge-fund

Stars: 3,000+ | Language: Python

Status: Active

Features

- AI agents modeled after famous investors
- Risk manager agent
- Portfolio manager for decisions
- Educational/proof of concept

Ghostfolio

URL: https://github.com/ghostfolio/ghostfolio

Stars: 4,000+ | Language: TypeScript

Status: Very Active

Features

- Open source wealth management

- Stocks, ETFs, crypto tracking
- Performance analytics
- Self-hosted

What's Missing

- Personal finance focus
- No institutional features
- No multi-manager support

IBOR (Investment Book of Record)

Key Finding

No open-source IBOR implementation exists.

All IBOR solutions are commercial:

- SimCorp Dimension
- BlackRock Aladdin
- Bloomberg AIM
- Advent Geneva
- SS&C

This represents a significant opportunity for RISKCORE.

Curated Resource Lists

awesome-quant

URL: https://github.com/wilsonfreitas/awesome-quant

Stars: 17,000+

Comprehensive list of quant finance libraries including:

- Trading platforms
- Backtesting frameworks
- Risk analysis tools
- Data providers
- Machine learning for finance

Gap Analysis for RISKCORE

What Exists (Solved Problems)

Capability	Best Solution	Maturity
Portfolio optimization	Riskfolio-Lib	Excellent
Performance analytics	pyfolio/QuantStats	Good
VaR calculation	ibaris/VaR	Basic
Derivatives pricing	FinancePy	Excellent
Financial data	OpenBB	Excellent
Wealth tracking	Ghostfolio	Good

What's Missing (RISKCORE Opportunities)

Gap	Current State	RISKCORE Solution

**Multi-manager aggreg	Nothing exists	Core feature
**Real-time position t	Spreadsheets	Position API
Cross-PM netting	Manual	Automated detection
Firm-wide VaR	Not available	Correlation-aware VaR
IBOR	Commercial only	Open-source IBOR
**Source-agnostic inge	Each tool has own form	Universal adapters
**Natural language que	None	Claude integration

Technical Gaps in Existing Projects

- **No Multi-Portfolio Architecture**
- All projects assume single portfolio
- No hierarchy (fund -> PM -> strategy)
- No aggregation across portfolios
- **No Real-Time Position Management**
- Most work with historical returns
- No live position tracking
- No intraday updates
- **No Cross-Asset Aggregation**
- Projects specialize (FI, equity, derivatives)
- No unified multi-asset view
- No netting across asset classes
- **No Identifier Reconciliation**
- No CUSIP/ISIN/SEDOL mapping
- No security master concept
- Manual identifier handling
- **Limited Risk Aggregation**
- VaR at portfolio level only
- No correlation handling across PMs
- No firm-wide stress testing

Recommendations for RISKCORE

Leverage Existing Libraries

Library	Use For	Integration
Riskfolio-Lib	Portfolio optimization	Optional module
FinancePy	Derivatives pricing	Greeks calculation
OpenBB	Market data	Data ingestion
QuantStats	Performance reporting	Report generation

Build What's Missing

- **Position Aggregation Engine**
- Multi-source ingestion
- Identifier reconciliation
- Hierarchy management
- **Risk Aggregation Layer**
- Correlation-aware VaR
- Cross-PM netting
- Firm-wide stress tests
- **Real-Time Infrastructure**

- WebSocket updates
- Supabase real-time
- Event-driven architecture
- **Natural Language Interface**
- Claude API integration
- Query understanding
- Risk insights generation

Differentiation Strategy

Feature	Existing Projects	RISKCORE
Target user	Single PM / Quant	CRO / Risk team
Portfolio scope	One portfolio	Firm-wide
Data sources	One system	Any source
Updates	Batch / Historical	Real-time
Queries	Code / API	Natural language
Cost	Free (limited)	Free + Enterprise

Sources

- [GitHub Topics: Portfolio Management](https://github.com/topics/portfolio-management)
- [GitHub Topics: Risk Management](https://github.com/topics/risk-management)
- [GitHub Topics: Value at Risk](https://github.com/topics/value-at-risk)
- [GitHub Topics: Quantitative Finance](https://github.com/topics/quantitative-finance)
- [awesome-quant](https://github.com/wilsonfreitas/awesome-quant)

Research compiled for RISKCORE competitive analysis