BRIAN G. PETERSON

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SUMMARY

Senior quantitative trader, financial analyst, technical architect, and project delivery leader with broad-based P&L, delivery, consulting, and line management expertise. Over fifteen years experience in design, construction, and integration of technically innovative systems in multiple industries including insurance, mortgage, health care, automotive, manufacturing, investment banking, brokerage, alternative investments, and proprietary trading. Holds direct operational and P&L responsibility while developing asset and trading management strategies in addition to research and development tasks.

APPLICABLE SKILLS

Quantitative Strategies: I have developed and put into production quantitative models for trading strategies, valuation, performance and risk analysis, and portfolio construction for asset managers, proprietary trading, investment banks, and exchanges. I have demonstrated skills across equities, derivatives, fixed income, structured products, and hedge funds. I am skilled at understanding, using, and replicating published quantitative models and also at developing and refining new models. I regularly write and speak on quantitative topics in major journals and conferences, and teach in the Computational Finance and risk Management Department at the University of Washington.

Portfolio Construction: Choosing the size of an investment is a complementary process to choosing the instrument to invest in. I've developed and profitably applied portfolio construction tools for proprietary trading, structured products, and hedge fund style selection optimizers for a fund of funds or institutional setting, as well as a utility function based optimizer for asset allocation (asset weighting) within a single or multi-style/strategy portfolio. I have evaluated or used multiple different optimizer methodologies to make sure that the correct optimization method is used for portfolio construction based on the nature of the specific portfolio.

Dynamic Hedging: We developed quantitative models to calculate the correct hedging instrument for portions of the portfolio based on the correlations of the combined portfolio to several highly liquid derivatives. This capability gives a portfolio manager both the ability to "buy insurance" when there is a good return stream to protect, and to react to sudden changes in the markets without having to unwind a large number of positions that you might still be confident of over a longer time frame. This type of hedging is relevant and important across asset classes and investment horizons.

Quantitative Investment Screening: Returns for most asset classes, investment styles, and funds are not normally distributed, so statistical methods that rely on or assume a normal distribution are very fragile for analyzing these assets. I have developed and published **R** statistical analytics functionality that match the latest econometric research in analyzing asset classes for risk, autocorrelation (identifying problems of illiquid or manually marked books), persistence of returns, style analysis and style drift, factor modeling, portfolio construction, and other areas.

Heuristic Screening: Investments in a portfolio of alternatives involve both heuristic and quantitative components. We assisted a large institutional client in standardizing the heuristic process for screening investments, helping to set guidelines for describing what traits in an asset should be considered beyond direct performance analysis.

Trade Processing and Reference Data: I have developed reference data systems and analytics engines for major asset managers, trading firms, and investment banks. We developed and licensed to our clients a middle and back office trade processing, reconciliation, and P&L accounting system that handled 300,000-500,000 trades per month across more than 12 prime/clearing brokers and 50+ prime broker accounts in multiple currencies and instrument/asset classes. Our **R** trade blotter and instrument reference data packages have been used on tens of thousands of trades as a component of creating and evaluating automated trading strategies.

Process Discovery, Analysis, Automation: Productivity growth often hinges upon the ability of an organization to discover, analyze, refine, and automate business processes that were once ad-hoc and manual. I have deep experience in process discovery and analysis from my years as a management consultant, and have applied these skills in proprietary trading, the hedge fund industry, at major asset managers, and investment banks.

Technology Expert: I have extensive technical implementation expertise across most modern computational technologies. Once processes have been identified as candidates for automation, an implementation path must be chosen that is both efficient and economical. I can manage and add value to the entire technology project life cycle.

METHODS and TECHNOLOGIES

Strategy Modeling: statistical arbitrage, mean-reversion (spreads and outrights), regression/factor models, industry/style portfolios, trend models, and technical indicators across all asset classes and frequencies from microseconds to years

Analytical Methods: non-normal distribution analysis, Risk-adjusted return analysis, (e.g. Sharpe, Sortino, Omega), cointegration, pricing models (*see Pricing*), regression methods, multiple optimization methods (*see Optimization*)

Risk: simulated scenario risk, drawdown analysis, Value at Risk (VaR,all major methodologies), component risk decomposition, Expected Shortfall (ES/CVaR/ETL), shock/slide scenario analysis, default models (loans/bonds)

Pricing: factor analysis, PCA, technical indicators (ranges, momentum, volatility, volume), Monte Carlo simulations, Bayesian, robust, ARIMA, GARCH, term structure(bonds/FI), discounted cash flow (bonds), 2-4 moment CAPM

Optimization: optimize non-convex portfolios utilizing brute force, heuristic rules, linear programming, random portfolios, quadratic objectives, simulated annealing, Differential Evolution, and complex utility based optimization approaches

PROFESSIONAL EXPERIENCE

DV Trading, (formerly Rosenthal Collins Capital Markets), Chicago, IL **2011- present**
Partner | Head Trader | Automated Trading
- responsible for development, operations, and P&L of multi-million dollar automated futures strategies
- deployed three new algorithmic trading execution platforms

Cheiron Trading, Chicago, IL **2010-2011**
Director of Quantitative Analysis
- Created new quantitative research, development, and reference data teams and infrastructure
- Developed intraday statistical arbitrage and quantitative market making futures strategies

Breakwater Trading, Chicago, IL **2009- 2010**
Sr. Financial Engineer, Statistical Arbitrage
- Developed and refined mean reversion and relative value quantitative strategies. $10M/yr+ desk P&L
- Introduced high performance computing clusters to the organization to allow for complex quantitative analysis.

Canadian Imperial Bank of Commerce, global **2008-2009**
Senior Risk and Quantitative Analyst *(ED-level term contract)*
- Analyzed and created models for risk and valuation of a $15B structured products portfolio (CDO,ABS,CLO)
- Led due diligence and purchase of a $4.5B CLO manager to transition from run-off book to active portfolio

Diamond Management and Technology Consultants, Chicago, IL **2007-2008**
Knowledge Leader – Finance
- Conducted research in new risk and portfolio construction methodologies
- Provided leadership in quantitative methods and technologies for capital markets and investment management

Explorer Fund Advisors, Chicago, IL **2003-2006**
Chief Technology Officer, Lead Quantitative Analyst
- Developed quantitative investment models, portfolio construction algorithms, and portfolio optimization
- Managed the technology and strategy consulting business and resources for Explorer's institutional clients

CryptoRights Foundation, San Francisco, CA **2002-2003**
Lead developer – Highfire
- Lead design and development of a secure cryptographic platform for use by human rights workers
- CryptoRights is a NGO dedicated to the protection of human rights workers and the information they collect

eLoyalty, Lake Forest, IL **1994-2002**
Vice President – Technology *(started as a Programmer/Analyst/Sr. Consultant)*
- Designed and developed large, technically complex systems using a wide range of technologies
- Project Lead and Subject Matter Expert for teams of up to 50 resources with budgets of $2-20 million/yr

PD&C, Inc., Madison, WI **1989-1994**
Owner
- Grew the company from 1-15 employees. Successfully sold the company to my largest client
- Designed and developed several applications in the virtual reality and scientific simulation fields

SELECTED RECENT and PRE-PRESS PUBLICATIONS

Lecturer (Adjunct Faculty), University of Washington. Lead Instructor, *CFRM 561 Advanced Trading Systems Development.* 4-credit masters course.

Keynote: *High-performance computing and algorithmic trading.* Trading Show Chicago 2016.

Keynote: *HPC Patterns in Finance*. Supercomputing 2015, Finance Workshop (WHPCF).

Developing & Backtesting Systematic Trading Strategies. Brian Peterson, 2015-2016. http://goo.gl/na4u5d

Research Replication. Brian Peterson, 2015. http://goo.gl/tRzyCP

Asset Allocation with Conditional Value-at-Risk Budgets . Kris Boudt, Brian Peterson, Peter Carl. Journal of Risk, 2013. http://www.risk.net/journal-of-risk/technical-paper/2253117/asset-allocation-with-conditional-valueatrisk-budgets

Differential Evolution (DEoptim) for Non-Convex Portfolio Optimization. David Ardia, Kris Boudt, Peter Carl, Katharine Mullen, Brian Peterson. R Journal, June 2011 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1584905

Using quantstrat to evaluate intraday trading strategies. Brian Peterson and Jan Humme. Seminar presentation at R/Finance 2013. http://www.rinfinance.com/agenda/2013/workshop/Humme+Peterson.pdf

Quantitative Strategy Construction and Testing in R. presentation at R/Finance 2011, Chicago, IL.

Business Objectives and Complex Portfolio Optimization. Brian Peterson and Peter Carl. Seminar presentation at R/Finance 2010. http://www.rinfinance.com/agenda/2010/Carl+Peterson+Boudt_Tutorial.pdf

TradeAnalytics: a collection of R packages for trading and price-based analysis. Brian Peterson, Peter Carl, et. al. 2009-2011. http://r-forge.r-project.org/R/?group_id=316

Analysis of Multivariate Moments and Co-moments for Financial Time Series. Brian Peterson, Peter Carl, and Kris Boudt. Journal of Statistical Software *(target)*. In revision.

Performance Analysis in R. seminar presentation given at R/Finance Chicago 2009 and R/RMetrics Conference Meielisalp, Switzerland, 2009. R/Finance website

Estimation and Decomposition of Downside Risk. Kris Boudt and Brian Peterson and Christophe Croux. Journal of Risk. Winter 2008 11(2) 79-103. http://www.thejournalofrisk.com/public/showPage.html?page=jor_v11n2a4

Component VaR for a non-normal world. Brian Peterson and Kris Boudt. RISK Magazine. November 2008 78-81. also reprinted in AsiaRISK. http://www.risk.net/public/showPage.html?page=823941

Hedge Fund Portfolio Selection with Modified Expected Shortfall. Kris Boudt and Brian Peterson and Peter Carl. Computational Finance. May 2008.
http://library.witpress.com/pages/PaperInfo.asp?PaperID=18906

Portfolio Risk Decomposition using Modified VaR and Expected Shortfall. Brian Peterson. MFA Conference. March 2008.

Exploratory Data Analysis in Finance using PerformanceAnalytics. Brian Peterson and Peter Carl. presented at the UseR! International R User and Developer conference, Ames, Iowa, August 2007.

Keynote: *Portfolio Selection, Risk Analysis, and Optimization*. Brian Peterson. presented at the R/RMetrics International User Conference in Meielisalp, Switzerland, July 2007.

PerformanceAnalytics: An R package for Performance and Risk Analysis in Finance. Brian Peterson and Peter Carl. 2004-2016. http://cran.r-project.org/src/contrib/Descriptions/PerformanceAnalytics.html

I am a peer reviewer for several book publishers and journals in finance and technology.

On the program committee for the global R/Finance and UseR! conferences, and has previously served on the program committee for MFA, R/Rmetrics, and Trading Show conferences.