

ROBERT J. VANDERBEI

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Financial Engineering
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SENIOR THESES ADVISED

1993

Derrick, Mitchell J.	Implementation and Graphical Representation of the Revised Simplex Method
Grandinetti, Russell	A Graphical Interface for Linear Programming Solutions to Optimal Structures
Ko, Judy I.	Modeling Telecommunications Circuits to Estimate Traffic Information from Partial Data

1994

Eagleson, David C.	Power Cost Minimization for the Snowmaking Industry
Iannone, James J.	A Maximum Likelihood Approach to O-D Matrix Estimation and Its Application to Advanced Traffic Management Systems
Jennings, Otis Brian	Approximating Blocking in Nonstationary Circuit Switched Networks
Meyer, Michael E.	Minimizing Empty Repositionings of Motor Carrier Vehicles through Queueing Theory

1995

Belldina, Jeremy	The Stochastic Optimization of Agent Allocation in 800# Services
Cassidy, Jeffrey W.	Facility Location for Bridgestone/Firestone, Inc.
Chang, Isaac J.	A Modeling Language-Solver Link for Exploiting Structure in Non-linear Programming
Mathey, Roderic M.	Optimization of Two- and Three-Dimensional Structures

Murphy, Adam M.	The Price Relationship Between Index Options and the Options on the Stocks Comprising the Index
Stephens, Brandon	A Proposed Statistical and Methodological Solution for Allocating Global Emission Permits
Woolbert, Jeffrey S.	Inbound Freight Network Improvements: A Case Study of Bridgestone/Firestone, Inc.

1996

Dunnion, Gregory C.	An Analysis of the Growth Options Confronting a Regional Brewery - or - To Brew or Not to Brew?
Garofoli, Matthew J.	Measurement and Statistical Analysis of Project Team Performance at Dow Jones
Karleski, Koleman	An Analysis of the Sale of a Major League Baseball Franchise
Kneip, Frederick H.	IPO Modeling to Optimize Investor Returns

1997

Garcia, Victoria	Robust Risk Management Models in Finance
Landfried, Jade	Crude Oil Trading System
Whalen, Michael	A Simulation for Targeted Advertising

1998

Middleton, Charles	Multiperiod Strategies in U.S. Air Force Airlift Scenarios
Shanahan, Michael	The Effects of Accounting for Geographic Obstacles in a Territory Alignment Model
Sisk, Marja	Optimization of Short-Term Hydrothermal Power Coordination: A Comparison of Two Methodologies
Turcinov, Lucija	The Effect of Testing Frequency on the Efficiency of a Telephone Network

1999

Gormley, Kevin J.	Analysis of the U.S News and World Report College Ranking System
Keller, Michael R.	A Perishable-Asset Revenue Management Approach to Baseball Ticket Sales
Kumahor, Sandra V.	An Optimization-Based Approach to Equity Portfolio Construction in Emerging Markets
Maly, Timothy J.	A Scheduling Approach for Profit Maximization in the National Football League
de Brun, John	The Optimization of a Warehouse Capacity Model

2000

Bowman, Erica	The Benefits of Various Objective Functions Associated with the Linearized Optimal Power Flow Problem
Kimber, Ryan	Design of an Optimization-Based Graphic Equalizer
O'Malley, Daniel	Bandwith Allocation in Packet Networks Using Class and Delay Based Queueing

2001

Amaruchkul, Kannapha	Case Study in Bang-Off-Bang Control: Alternative Approach via Nonlinear Optimization
Korpita, Dylan E.	The Future of the Strategic Petroleum Reserve
McDell, Jamaal	Quasi-Data Envelopment Analysis: A Guide to Fairer, and More Personalized College Rankings

2002

Davila, Julio	Assignment Decision for an Icelandic Fishing Fleet
Gonzalez, Christopher	Operation Pluto: A Mission to the Planet of Darkness
Hutchinson, Andrew	Baseball Pitching Strategies Using Stochastic Optimization
Rosskamm, Michael	Optimal High School Size in an Urban Environment

2003

Buonocore, Kenneth	Optimal Baseball Betting Strategies: An Analysis of the Money Line.
Chou, Edward	Braess Paradox and Traffic Equilibrium.
Danaher, Elizabeth	Treating Cancer with Computers: Optimization Methods for Radiotherapy Treatment Design.
Guharay, Sabyasachi	A Mathematical Study of the Price Stability of Various Sectors in the US Financial Market.
Haselkorn, Dov	Absolute Versus Squared Deviation. A Historical Comparison of Hedging Strategies
White, Jason	Detecting Terrestrial Planets in the Cosmos: Optimization Algorithms for the Correction of Phase Aberrations in the Shaped Pupil Coronagraph.

2004

Ference, John Paul	Stochastic Efficiency in Portfolio Optimization: Properties and Computation
Osnato, William Peter	Proposed Changes to Princeton Dining Services Under a Four Year Residential College System

2005

Bynum, Scott Saunders	Convertible Bond and Stock Option Markets: An Analysis of the Implied Equity Volatility Spread
Jin, Fan	Measuring the Relative Accessibility of the Princeton Campus for People with Disabilities
Lulli, Fernando M.	Effects of Nonstationary Emergency Call Arrival Rates on an Ambulance Response System
Martin-Easton, Marquis	How Much are they Really Worth? Optimization of the NBA Free Agent Market

2006

Eber, Michael R.	An Optimization Analysis of Eating at Popular Restaurant Chains
Moore, Robert J.	A Dynamic Programming Approach to Decision Making in Texas Hold'em Poker
Wilson, Andrew	Multivariate Analysis of NCAA Division I-A Football for The Purpose Of Predicting Games
Wood, Brittany	Portfolio Optimization Involving Short Sales

2007

Berlin, Lev	Snowmaking: An Approximate Dynamic Programming Approach to Decision Making for Ski Resorts
Cloutier, Sharla	Probability Distribution Models for the Hurricane Damage Process
England, William D.	"Super-Indexing the GSCI": Portfolio Optimization in Commodity Futures Markets
Jacobson, Max	A Tour Through the Traveling Salesman Problem: An Implementation with Experiments
Mirabello, Alexander	Algorithms for Solving and Generating Sudoku Puzzles
Zhong, Yan	The Real Deal: Evaluating Decision Rules For Deal or No Deal

2008

Baity, Michael P.	Gambling Your Investment: Applying the Kelly Criterion to Portfolio Theory
Yegya-Raman, Anand	Real Options Analysis as Applied to Research and Development Project Valuation in the Pharmaceutical Industry

2009

Hines, Lily Katharine	Gerrymandering: An Operations Research Approach
Scharf, Gordon	Grade Rank: A Mathematical Approach to Contextualizing Grades
Stallings, Kelsey	Modeling the Impacts of Policy on Forecasted Energy Demand in Highway Transportation

Tzeng, Stephanie C.	Agent-Based Computational Economics and the Banking Sector
Yang, Siyu	A Star Pattern Recognition Algorithm for Astronomical Images Using Triangles

2011

Anastasi, Caroline	An Analysis of a Tax on Sugar-Sweetened Soft Drinks Through an Examination of the Differential Response to Price
Chu, Henry	Non-Redundant Aperture Masking and its Application in the Analysis of Stars with Planetary System
Connolly, James	A Regression Analysis of Madden NFL Team and Player Ratings
Kim, Soo Kyung	Optimal Yield Management Strategy for the concert Industry: The Newsvendor Problem with Pricing
Narain, Chetan Hari	Predicting Politics: A Mathematical Approach to Parsing and Evaluating Presidential Campaign Speeches
Ren, Kexing Christina	An Analysis of Wireless Telecommunication Churn Rates Using Data Mining Methods

2012

Lu, Ming	Fitting Regression Models to Global Temperature Trends
Xia, Mark Teng	Establishing Practical Diets that Meet USDA and IOM Dietary Guidelines Using Mixed-Integer Linear Programming

2013

Chang, Iris	Face Detection, Tracking Methods, and Image Processing: A MATLAB Approach
Germain, Sarah	Analyzing and Presenting Modern Temperature Trends
Kaelin, Christina	The Linear Simplex Method: Investigations of Cycling and Application to Markov Decision Processes

2014

Chai, Hanfu	Image Processing and Computer Vision in Basketball Detection and Tracking
Choi, Andrew	Copacetic: An Optimization Platform for Software Defined Networks
Fierstein, Lisa	Measuring Portfolio Risk: Using the Markowitz Model, Conditional Value at Risk, and Risk Parity for Asset Allocation in Medium-Duration Investments

2015

Cai, Regina	Uncertainty Quantification for the Gaussian Information Bottleneck
Samuels, Joshua	Exploring New Worlds: Simulating Coronagraph Data for Exoplanet Detection
Sharma, Varun	Dark Ages for the Golden Arches A Predictive Analysis of McDonald's Corporation's Global Growth Through Newly Accessed Markets

2016

King, Veenu	ARIMA, ARIMAX, or Univariate Linear Model? Modeling Sea Surface Temperature Anomalies' Affect on California's Crop Production
Su, John	Giving Color to the Financial Markets: Macroeconomic Information Engineering Through Machine Learning and Portfolio Optimization
Wang, Jean	A Supervised Topic Model Based Approach for Change Point Detection in Review Data
Xuto, Poon Bee	Optimizing a Portfolio of Impact Investments: A Focus on Practicality and Financial Performance
Yan, Jeffrey	OPTION VALUATION FOR INTEREST RATE CAPLETS: RATE VOL CORRELATION AND FAIR SKEW

2017

Bressler, Max	Just What the Financier Ordered? A Methodology for the Securitization of Medical Device Receivables
Jeon, Serena	Walking on Wall Street in Heels: A Quantitative and Sociological Approach to Gender and Recruitment in Finance
Osborne, Trevor	Catching an Optimal Draft Pick like 1-3: Formulating a Valuation Policy for Wide Receivers in the NFL
Roth, Tyler	Valuing Asymmetric Information Under Differing Market Conditions
Singleton, Alexander	A Search for Exo-Moons in the Kepler Data via the Orbital Sampling Effect

2018

Kiles, August	Deep Coaching: A Deep Learning Approach for Human Action Recognition in Photos and Videos of Athletic Motions
Manoloff, Alexandra	Effective and Effectively Trading Information: Exploring the Extent to Which Continuing Disclosures Affect the Secondary Market for Municipal Securities
Plissner, Molly	A Study of Earthquake Seasonality in Japan Through Network Analysis
Schafer, Benjamin	Small Fish in a Big Pond: Using Data to Predict the Success of Swimmer in College
Wilson, Daniel	Deep Learning Applications in Multidimensional Cash Flow Forecasting

2019

Campeau, Michelle	Eating Clean: Using Nutrition, Environmental Sustainability, and Personal Preference to Create an Ideal Diet Plan
Kabir, Tazim	Lightning Bugs or Fireflies? A Machine-Learning Approach to U.S. Dialects and Presidential Elections
Kelly, Adam	Kernel-Based Outlier Detection For IoT Networks
Nag, Rik	Scheduling Exoplanet Observations Across A Network Of Telescopes
Weissmann, Joshua	Contrast Dyes and Cancer Maps: Approaches to Image Registration with Appearance Changes in Breast CT Scans

2021

Melnyk, Josh	Outperforming the S&P 500: A Computational Approach to Dynamic Portfolio Optimization
Wang, Eileen	Diagnosing Racial Bias in Machine Learning: An Examination of Fairness in Medical Appointment Scheduling Optimization Models
Yardi, Anika	Using Monte Carlo Markov Chain Methods to Understand the Mathematics and Visualization of Gerrymandering in Politically Competitive Districts
Yassky, Daniel	Terror and Intelligence: Modeling The Operation of an Intelligence Agency Through Statistically-Informed Monte Carlo Terror Queues

2022

Jung, Addie	COVID Misinformation Spread on Korean YouTube
Larson, Connor	Establishing the Case for Electric Regional Aircraft: Market Considerations and Optimal Routing