Honours Theses
(2006–2016)[1]
School of Mathematics and Applied Statistics
University of Wollongong

UOW AUSTRALIA

Last updated: March 23, 2017

[1]Compiled by Dr. Marianito Rodrigo (Honours Coordinator).

2016

1. **Multi-product stochastic inventory analysis with general substitution: a counting process formulation**, BMathAdv, *Supervisor*: Pam Davy
2. **Modelling and forecasting electricity spot prices**, BMathAdv, *Supervisor*: Yan-Xia Lin
3. **Groupoid C^*-algebras**, BMath, *Supervisor*: Aidan Sims
4. **Interest rate modelling and bond pricing**, BMath, *Supervisors*: Joanna Goard and Pam Davy
5. **Optimal transport and the far field reflector problem**, BMath, *Supervisor*: Jiakun Liu
6. **Theoretical prediction of the cell survival curve**, BMath, *Supervisors*: Susanna Guatelli and Xiaoping Lu
7. **REML estimation for finite Gaussian mixture models**, BMedMath, *Supervisor*: Thomas Suesse
8. **Survival analysis in the presence of competing risks**, BMedMath, *Supervisor*: Thomas Suesse
9. **Comparison of numerical approaches for option pricing**, BMathFin (DS), *Supervisor*: Xiaoping Lu
10. **Pricing American options under stochastic volatility using the Mellin transform**, BMathFin (DS), *Supervisor*: Marianito Rodrigo
11. **Stochastic temperature models for the pricing of weather derivatives**, BMathFin, *Supervisor*: Marianito Rodrigo
12. **Comparing the pricing performance of the Heston model under different martingale measures**, BMathFin, *Supervisor*: Song-Ping Zhu

2015

13. **Bott periodicity in operator K-theory: a selection of proofs**, BMathAdv, *Supervisor*: Adam Rennie
14. **The Atiyah-Singer index theorem**, BMathAdv, *Supervisor*: Adam Rennie
15. **Event horizons of black holes**, BMathAdv, *Supervisors*: Glen Wheeler and Valentina Mira-Wheeler
16. **Pricing American options in a two-state regime-switching economy**, BMathAdv, *Supervisors*: Song-Ping Zhu and Ivan Guo
17. **Pricing short tenor options under stochastic volatility models**, BMath, *Supervisor*: Joanna Goard

18. **Mathematical and numerical study for some problems in biology**, BMath, *Supervisors*: Natalie Thamwattana and Wenting Chen

19. **The impact of media campaigns on the spread of alcoholism**, BMath, *Supervisors*: Mark Nelson and Annette Worthy

20. **Homology and k-graphs**, BMath, *Supervisor*: Nathan Brownlowe

21. **Improving the computational efficiency of model based design with an application to the design of multiphase experiments**, BMedMath, *Supervisors*: Brian Cullis and Emi Tanaka

22. **On spatial model selection for phenotypic experiments in plant improvement programs**, BMedMath, *Supervisors*: Brian Cullis, Alison Smith and Emi Tanaka

23. **Modelling foreign portfolio investment holdings: gravity model with social network analysis**, BMathFin (DS), *Supervisors*: Pavel Krivitsky and Thomas Suesse

24. **Portfolio rebalancing: the most optimal strategy to use in rebalancing**, BMathFin, *Supervisor*: Pam Davy

25. **Optimisation of portfolio based on the measure of VAR**, BMathFin, *Supervisor*: Yan-Xia Lin

2014

26. **Applications of mathematics in forensic science**, BMathAdv, *Supervisor*: Marianito Rodrigo

27. **Balanced topological groups and related structures**, BMathAdv, *Supervisor*: Peter Nickolas

28. **Impact of data frequency on pairs trading**, BMathFin, *Supervisor*: Yan-Xia Lin

29. **Scaling daily volatility to weekly volatility by $\sqrt{5}$: an empirical investigation**, *Supervisor*: Yan-Xia Lin

2013

30. **Mathematics of the CT scan**, BMathAdv, *Supervisors*: Marianito Rodrigo and Annette Worthy

31. **KMS states in quantum statistical mechanics**, BMathAdv, *Supervisor*: Adam Rennie

32. **Poincaré duality**, BMathAdv, *Supervisors*: Adam Rennie and Aidan Sims

33. **Computational fluid dynamics using the lattice Boltzmann method**, BMathAdv, *Supervisors*: Mark Nelson and Tomasz Bednarz

34. **Mathematical modelling of the effect of lifestyle on glucose control for type II diabetes**, BMathAdv, *Supervisor*: Xiaoping Lu

35. **Total-travel allowance restraint system for travelling commodities: modelling fairness for the law component of the total-travel allowance**, BMathAdv, *Supervisors*: Shuaian Wang and Joshua Fan

36. **Imputation as a method of estimation in linear mixed models**, BMedMath, *Supervisors*: Brian Cullis, Simon Diffey and Alison Smith

37. **Volatility forecasting using Value at Risk estimates**, BMathFin (DS), *Supervisor*: Yan-Xia Lin

38. **Algorithmic trading using short interest as the primary trading signal**, BMathFin (DS), *Supervisors*: Chandra Gulati and Michael McCrae

39. **On the use of ordinal scales for the analysis of disease traits in grain crops**, BMathFin (DS), *Supervisors*: Brian Cullis and Simon Diffey

40. **Economic indicators for the Australian dollar: modelling and implications**, BMathFin, *Supervisor*: Thomas Suesse

41. **An analysis of the price behaviour of American depositary receipts and their corresponding Australian shares around the dividend announcement date**, BMathFin, *Supervisors*: Aelee Jun, Chandra Gulati and Michael McCrae

2012

42. **Twisted relative Cuntz-Krieger algebras associated to finitely aligned higher-rank graphs**, BMathAdv, *Supervisors*: Aidan Sims and Mike Whittaker

43. **p-negative metric spaces**, BMathAdv, *Supervisor*: Peter Nickolas

44. **Mathematical modelling in medicine: diffusion in drug-eluted stents**, BMedMath, *Supervisors*: Annette Worthy and Marianito Rodrigo

45. **Transform methods for Asian options**, BMath, *Supervisor*: Joanna Goard

46. **Extracting local volatility using the Dupire formula**, BMathFin (DS), *Supervisor*: Song-Ping Zhu

47. **Pricing American options with an integral equation approach**, BMathFin, *Supervisor*: Xiaoping Lu

48. **External debt burdens: Greece and Spain**, BMathFin (DS), *Supervisor*: Xiaoping Lu

49. **Random volatility in Black-Scholes for improved pricing of stock options**, BMathFin, *Supervisors*: Thomas Suesse and Michael McCrae

50. **Evaluation of the trade-off between disclosure risk and data utility of perturbation methods**, BMathFin, *Supervisor*: Pam Davy

51. **Time-varying beta on Australian industry portfolios: an empirical study**, BMathFin, *Supervisor*: Pam Davy

52. **Hedonic modelling for laptop computers**, BMathFin, *Supervisor*: Yan-Xia Lin

53. **Basket trading using cointegration approach**, BMathFin, *Supervisor*: Yan-Xia Lin

2011

54. **Illustrations of non-standard Bayesian semiparametric regression**, BMathAdv, *Supervisor*: Matt Wand
55. **Projective limits and inductive limits**, BMath, *Supervisor*: Aidan Sims
56. **Maximising the quality of life with the presence of hazardous sex and AIDS**, BMath, *Supervisor*: Xiaoping Lu
57. **China's economic ties with the U.S.: a dynamic framework for analysis**, BMathEcon, *Supervisors*: Joanna Goard and Grant Cox

2010

58. **Construction of K-coloured graphs**, BMathAdv, *Supervisors*: Iain Raeburn and Aidan Sims
59. **Mathematical modelling of sand filtration to improve water quality**, BMathAdv, *Supervisors*: Mark Nelson and Maureen Edwards
60. **D-optimal design for generalised linear models**, BMathAdv, *Supervisor*: Ken Russell
61. **Multivariate highest density difference region estimation**, BMathAdv, *Supervisor*: Matt Wand
62. **Calculating semi-variogram confidence intervals**, BMath, **Supervisor**: Robert Clark
63. **A study on I-CAPM: empirical approach on the Australian Securities Exchange**, BMathFin, *Supervisors*: Chandra Gulati and Dionigi Gerace
64. **Pricing foreign exchange and interest rate options using partial differential equations**, BMathFin, *Supervisors*: Adam Kucera, Tim Marchant and Justin Lazar
65. **Analysing the Australian financial sector using a game theoretic approach**, BMathEcon, *Supervisor:* Pam Davy
66. **Economic implications of the water crisis**, BMathEcon, *Supervisor*: Grant Cox

2009

67. **Volume-preserving flow by powers of the mth mean curvature**, BMathAdv, *Supervisor*: James McCoy
68. **Pricing American-style down-and-out call options**, BMathAdv, *Supervisor*: Xiaoping Lu
69. **Exploring analytical solutions to regime-switching models**, BMathAdv, *Supervisors*: Xiaoping Lu and Song-Ping Zhu
70. **Projection and lifting of cubature rules**, BMathAdv, *Supervisor*: Peter Nickolas

71. **A fundamental analysis of mathematical modelling of the gastrointestinal tract**, BMathAdv, *Supervisors*: Mark Nelson and Barry Cox

72. **Multivariate highest density difference region estimation**, BMathAdv, *Supervisor*: Matt Wand

73. **Graphical presentations of the β-shifts**, BMathAdv, *Supervisor*: David Pask

74. **Advanced methodologies for maximin designs**, BMathAdv, *Supervisor*: Ken Russell

75. **Modelling controlled drug delivery**, BMath, *Supervisors*: Mark Nelson and Annette Worthy

76. **Design, analysis and implementation of choice surveys**, BMath, *Supervisors*: Anne Porter and Robert Clark

77. **Generalised linear models for insurance data**, BMathFin, *Supervisors*: Joanna Goard and David Griffiths

78. **Stochastic volatility models and the pricing and trading of VIX options**, BMathFin, *Supervisor*: Joanna Goard

79. **Pay dispersion within the top executive team and firm performance**, BMathFin, *Supervisors*: Pam Davy and Gary Tian

80. **Tracking a market index using reduced share portfolios: case study of the S&P/ASX200 price index**, BMathFin, *Supervisors*: Pam Davy and Michael McCrae

81. **Neural networks: arbitrage opportunities in the all-ordinaries index Part A**, BMathFin, *Supervisors*: Pam Davy and David Edelman

82. **Analytical approximation for the optimal exercise boundary of American put options**, BMathFin, *Supervisor*: Xiaoping Lu

83. **Pricing European barrier options**, BMathFin, *Supervisor*: Xiaoping Lu

84. **Empirical test of efficiency of Australian index options markets**, BMathFin, *Supervisors*: Chandra Gulati and Dionigi Gerace

85. **An empirical study into the distribution of all-ordinaries index stock reeturns: improving the log-normal model**, BMathFin, *Supervisors*: Chandra Gulati and John Rayner

86. **Quantile regression techniques: a comparison of earnings in Australia**, BMathEcon, *Supervisors*: Oleg Yerokhin and Yan-Xia Lin

87. **The sustainability of Australian's foreign debt**, BMathEcon, *Supervisor*: Yan-Xia Lin

88. **Pattern formations in vertically vibrated thin granular layers**, BMathSci, *Supervisor*: Jim Hill

2008

89. **Applications of dynamical systems to number theory**, BMathAdv, *Supervisors*: Rod Nillsen and Graham Williams

90. **Plateau's Problem – the existence of a minimal surface spanned in a given Jordan curve**, BMathAdv, *Supervisors*: Graham Williams and Rod Nillsen

91. **Modelling the propagation of disease in rabbit populations**, BMath, *Supervisors*: Mark Nelson and Annette Worthy

92. **Universal behaviour in one parameter nonlinear systems**, BMath, *Supervisors*: Graham Williams and Rod Nillsen

93. **Collisions between nematicons in** $(1 + 1)D$, BMath, *Supervisors*: Tim Marchant and Annette Worthy

94. **Statistical indicators for local government areas: a case study of the Shoalhaven LGA**, BMath

95. **Incorporating dividends into option valuation**, BMathFin, *Supervisor*: Joanna Goard

96. **Applying rescaled range methods to identify long-range dependence in Australian stock market**, BMathFin, *Supervisors*: Yan-Xia Lin and Pam Davy

97. **Forecasting foreign currency exchange rates with artificial neural networks**, BMathFin, *Supervisors*: Pam Davy and David Edelman

98. **The effect of currency exchange rate changes on Australia's outbound leisure tourism demand: an econometric analysis**, BMathEcon

2007

99. **Defining chaos**, BMathAdv, *Supervisors*: Rod Nillsen and Graham Williams

100. **Wave diffraction and radiation around an OWC device**, BMathAdv, *Supervisor*: Song-Ping Zhu

101. **The Hanna Neumann conjecture**, BMath

102. **Cointegration-based error correction models versus neural networks**, BMath, *Supervisors*: Michael McCrae and David Edelman

103. **Solute transport in unsaturated porous media**, BMath, *Supervisor*: Philip Broadbridge

104. **Solving the 2-D Black-Scholes equation with the boundary element method**, BMath

105. **New models and solutions for pricing weather derivatives based on temperature**, BMathFin, *Supervisor*: Joanna Goard

106. **Comparative analysis of the long-run dynamics of foreign exchange rates between Australia and its East Asian trading partners**, BMathFin, *Supervisors*: Chandra Gulati and Michael McCrae

107. **A comparative study of volatility models with respect to stock market return data**, BMathFin, *Supervisors*: Chandra Gulati and Michael McCrae

108. **A study of Monte Carlo method used for pricing American options**, BMathFin, *Supervisor*: Song-Ping Zhu

109. **On the method of fundamental solutions for pricing financial derivatives**, BMathFin, *Supervisor*: Song-Ping Zhu

110. **Quantifying the effect of correlation between forward and hazard rates on pricing credit default swaps and credit default swap options**, BMathFin, *Supervisor*: Song-Ping Zhu

111. **Markov Monte Carlo methods with a log stochastic volatility example Part B**, BMathFin, *Supervisor*: Pam Davy

112. **An empirical comparison of the forecasting accuracy of the Box-Jenkins method to the error-correction method as applied to selected Asian exchange rates**, BMathFin, *Supervisors*: Yan-Xia Lin, Chandra Gulati and Michael McCrae

113. **An evaluation of the recent performance of metacapitalism**, BMathFin, *Supervisor*: George Mickhail

114. **Upgrading roads in and out of Wollongong to reduce traffic accidents: a cost-benefit analysis**, BMathEcon, *Supervisors*: David Griffiths and David Steel

2006

115. **Wedge hopper flow for highly frictional granular materials**, BMathAdv, *Supervisor*: Jim Hill

116. **Spatial statistics and dynamic 3D graphics**, BMathAdv, *Supervisor*: Matt Wand

117. **Algorithmic protection of confidentiality in data exploration using scatterplots**, BMathAdv

118. **Valuing multi-asset options with the boundary element method**, BMath, *Supervisor*: Song-Ping Zhu

119. **Interpolation of multi-dimensional functions with multiquadratics**, BMath, *Supervisor*: Song-Ping Zhu

120. **Assessing the returns to the inside trader's stock recommendations: an empirical study of abnormal performance and market efficiency**, BMathFin, *Supervisor*: Pam Davy

121. **Optimal compliance strategy for energy firms under the Australian carbon pollution reduction**, BMathFin, *Supervisors*: Andrew Tan and Song-Ping Zhu

122. **An empirical analysis of external debt and economic growth**, BMathFin,
Supervisors: Yan-Xia Lin and Amnon Levy

123. **An empirical study of high dividend yield investment strategies in the Australian stock market**, BMathFin