Nils-Christian Detering (he/him/his)

CONTACT INFORMATION

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EDUCATION

Frankfurt School of Finance & Management
Ph.D. Mathematical Finance **September 2009 - February 2014**
(part-time until December 2011)

Supervisor: Prof. N. Packham
Date of defense: July 2014
Final thesis grade: **summa cum laude** (best possible grade)

University of Göttingen and University of Jena
Studies Mathematics **October 2001 - November 2006**

Exchange year: University of Lund
Vordiplom (B.Sc.): **very good** (best possible grade)
Diplom (M.Sc.): **very good** (best possible grade)

EMPLOYMENT

Department of Statistics and Applied Probability, University of California Santa Barbara, Santa Barbara, USA
Associate Professor (tenured) **July 2021 -**
Department of Statistics and Applied Probability, University of California Santa Barbara, Santa Barbara, USA
Assistant Professor (tenure-track) **July 2016 - June 2021**
Department of Mathematics, University of Munich, Munich
Post Doctoral Research Fellow **March 2014 - June 2016**
Frankfurt School of Finance and Management, Frankfurt
Research Associate **January 2012 - February 2014**
MathFinance AG, Frankfurt
Financial Engineer **June 2009 - December 2011**
Sal. Oppenheim, Frankfurt
Exotic Equity Derivatives Trader **October 2008 - March 2009**
Dresdner Kleinwort, Frankfurt
Exotic Equity Derivatives Trader/Structurer **January 2007 - September 2008**
d-fine, Frankfurt
Consultant, Trainee **February 2006 - April 2006**
SimCorp, Bad Homburg
Software developer, Trainee **July 2005 - September 2005**
University hospital, Marburg
Compulsory community servant **August 2000 - June 2001**

Research visits (week +)

- **Columbia University**, Department of Industrial Engineering and Operations Research, New York, US (February 2020)
- **Johns Hopkins University**, Department Applied Mathematics and Statistics, Baltimore, US (January 2020, March 2019)
- **University of Munich**, Workgroup Financial Mathematics, Germany (July 2019, July 2018, April 2017 - May 2017)
- **University of Oslo**, Centre of Mathematics for Applications, Norway (September 2018, March 2018, August 2017 - September 2017, May 2013, July 2012 - December 2012)
- **University of California Los Angeles**, Institute for Pure and Applied Mathematics (Program: Broad Perspectives and New Directions in Financial Mathematics), USA (March 2015 - April 2015)
- **University of Cambridge**, Isaac Newton Institute (Program: Systemic Risk: Mathematical Modelling and Interdisciplinary Approaches), UK (November 2014 - December 2014, August 2014 - September 2014)

Peer-Reviewed Publications

1. Benth F.E., Detering N., Krühner P.: *Stochastic Volterra integral equations and a class of first order stochastic partial differential equations*
   Stochastics: An International Journal of Probability and Stochastic Processes, accepted
2. Detering N., Meyer-Brandis T., Panagiotou K., Ritter D. *Suffocating Fire Sales*
   SIAM Journal on Financial Mathematics, accepted
3. Benth F.E., Detering N., Lavagnini S. *Accuracy of Deep Learning in Calibrating HJM Forward Curves*
   Digital Finance, (2021)
4. Detering N., Meyer-Brandis T., Panagiotou K., Ritter D. *Financial Contagion in a Stochastic Block Model*
   International Journal of Theoretical and Applied Finance, Vol. 23, No. 8 (2021)
5. Detering N., Meyer-Brandis T., Panagiotou K., Ritter D. *An Integrated Model for Fire Sales and Default Contagion*
   Mathematics and Financial Economics, Vol. 15, Page 59–101 (2021)
6. Benth F.E., Detering N., Krühner P. *Independent increment processes: A multilinearity preserving property*
   Stochastics: An International Journal of Probability and Stochastic Processes, Pages 1-30 (2020)
7. S. Janusonis, N. Detering, R. Metzler, T. Vojta *Serotonergic axons as Fractional Brownian Motion paths: Insights into the self-organization of regional densities*
   Frontiers In Computational Neuroscience, Volume 14, June (2020)
8. Detering N., Fouque J.-P., Ichiba T. *Directed Chain Stochastic Differential Equations*
   Stochastic Processes and their Applications 130(4), Page 2519-2551, April (2020)
9. Detering N., Meyer-Brandis T., Panagiotou K. *Bootstrap percolation in inhomogeneous and directed random graphs*
   Electronic Journal of Combinatorics, 26(2), Page 1-43, (2019)
10. Detering N., Meyer-Brandis T., Panagiotou K., Ritter D. *Systemic Risk in Networks*
    Springer Nature Editors: F. Biagini, G. Kauermann, T. Meyer-Brandis: Network Science - An Aerial View from Different Perspectives (2019)
11. Detering N., Meyer-Brandis T., Panagiotou K., Ritter D. *Managing Default Contagion*

in Inhomogeneous Financial Networks
SIAM Journal on Financial Mathematics, 10(2), Page 430-465 (2019)

12. Christodoulou P., Detering N., Meyer-Brandis T. *Local risk minimisation with multiple assets under illiquidity with applications in energy markets*
International Journal of Theoretical and Applied Finance, Vol. 21, No. 04, (2018)
13. Janusonis S., Detering N. *A stochastic approach to serotonergic fibers in mental disorders*
Biochemie, Jul 26 (2018)
14. Detering N., Packham N. *Model risk of contingent claims*
Quantitative Finance, Volume 16, Issue 9 , Page 1357-1374 (2016)
15. Benth F. E., Detering N. *Pricing and hedging Asian-style options on energy*
Finance & Stochastics, Volume 19, Issue 4, Page 849-889 (2015)
16. Detering N., Packham N. *Model risk in incomplete markets with jumps*
Springer Proceedings in Mathematics & Statistics, Vol. 99, Kathrin Glau et al: Innovations in quantitative risk management (2014)
17. Detering N., Weber A., Wystup U. *Return distributions of equity-linked retirement plans under jump and interest rate risk*
European Actuarial Journal, Volume 3, Issue 1, Page 203-228 (2013)
18. Detering N., Weber A., Wystup U. *Return distributions of equity-linked retirement plans*
Statistical Tools for Finance and Insurance 2, eds. Cizek P., Haerdle W., Weron R., Springer, Page 393-413 (2011)

Submitted Publications

1. Benth F.E., Detering N., Galimberti L.: *Neural Networks in Fréchet spaces*
2. Benth F.E., Detering N., Krühner P.: *Abstract polynomial processes*

Other publications

1. Detering N. (2021) *Book Review: Machine Learning in Finance, From Theory to Practice by Matthew F. Dixon, Igor Halperin, Paul Bilokon*, **Newsletter of the Bachelier Finance Society**
2. Detering N., Meyer-Brandis T. (2018) *Managing Default Contagion in Large Financial Networks*, **Yearbook: Frankfurt Institute of Risk Management and Regulation**, Page 169-171.
3. Detering N., Packham N. (2014) *Model risk in the trading book*, **Yearbook: Frankfurt Institute of Risk Management and Regulation**, Page 42-43.

Grants

- NSF Supplement: Early-science team on the Frontera system at the Texas Advanced Computing Center NSF #1921515. Research Call 2019, **0.4 million node hours + 15,000 USD** (together with Skirmantas Janusonis, Ralf Metzler and Thomas Vojta)
- California NanoSystems Institute (CNSI), Program development grant, Period: 2/1/2019-1/31/2020, **100,000 USD** (together with Skirmantas Janusonis and Chris Bates)
- BaCaTec Bavaria California Technology Center, Research Call 2018, **5,000 EUR** (together with Ralf Werner)
- NSF: Collaborative Research in Computational Neuroscience (CRCNS, Division Of Mathematical Sciences) NSF #1822517, Period: 8/15/2018-7/31/2020, **498,832.00 USD**

(together with Skirmantas Janusonis and B. S. Manjunath)
- NIH Exploratory/Developmental Research Grant #MH117488, Period: 7/1/2018-5/31/2020, **422,125 USD** (together with Skirmantas Janusonis and B. S. Manjunath)
- California NanoSystems Institute (CNSI) New Challenge Grant, Research Call 2017, **50,000 USD** (together with Skirmantas Janusonis and B. S. Manjunath)
- FIRM Frankfurter Institut für Risikomanagement und Regulierung, Research Call 2014, **113,000 EUR** (together with Francesca Biagini, Thilo Meyer-Brandis and Konstantinos Panagiotou)
- Europlace Finance Institute, Research Call 2014, **10,000 EUR** (together with Francesca Biagini, Thilo Meyer-Brandis and Konstantinos Panagiotou)
- FIRM Frankfurter Institut für Risikomanagement und Regulierung, Research Call 2012, **85,000 EUR** (together with Natalie Packham)
- Europlace Finance Institute, Research Call 2012, **10,000 EUR** (together with Natalie Packham)

Teaching Experience (UCSB only)

- MATH CS 120: Special Topics class (Random Graphs and Random Matrices) (Spring 2020)
- MATH CCS 121: Probability and Combinatorics (Spring 2019, Fall 2020, Fall 2021)
- PSTAT 160A: Applied Stochastic Processes (Fall 2018, Winter 2019, Winter 2021)
- PSTAT 170: Introduction to Mathematical Finance (Winter 2017, Fall 2017, Spring 2018)
- PSTAT 223C: Advanced topics in financial modeling (Spring 2018)
- PSTAT 221B: Advanced Probability Theory (Random Graphs and Systemic Risk) (Winter 2017)
- PSTAT 210: Measure Theory for Probability (Fall 2016, Fall 2017, Fall 2019, Fall 2020)
- PSTAT 213A: Introduction To Probability Theory And Stochastic Processes (Fall 2021)

Conference Presentations

(Invited presentations marked with *)
- *When do you Stop Supporting your Bankrupt Subsidiary?*, Informs Annual Meeting, Online (2021)
- *When do you Stop Supporting your Bankrupt Subsidiary?*, Informs Annual Meeting, Anaheim, in person (2021)
- *When do you Stop Supporting your Bankrupt Subsidiary?*, SIAM Annual Meeting, Online (2021)
- *When do you Stop Supporting your Bankrupt Subsidiary?*, Informs Annual Meeting, Online (2020)*****
- *Accuracy of Deep Learning in Calibrating HJM Forward Curves*, MathFinance Digital Conference, Frankfurt (online), Germany (2020)*****
- *Suffocating Fire Sales*, Informs Annual Meeting, Seattle, US (2019)
- *Suffocating Fire Sales*, Vienna Congress on Mathematical Finance - VCMF 2019, Vienna, Austria (2019)
- *Directed Chain Stochastic Differential Equations*, An afternoon of high-dimensional stochastics, Wolfgang Pauli Institute in Vienna, Austria (2019)*****
- *An Asymptotic Model for Fire Sales*, SIAM Conference on Financial Mathematics and Engineering, Canada (2019)*****

- *An Asymptotic Model for Fire Sales*, Joint Mathematics Meetings Baltimore, US (2019)**
- *Managing Default Contagion in Inhomogeneous Financial Networks*, Informs Annual Meeting Meeting Phoenix, US (2018)**
- *An Asymptotic Model of Fire Sales in Financial Systems*, Meeting Bachelier Finance Society, Ireland (2018)
- *Large linear systems of coupled diffusions*, 13th German Probability and Statistics Days, Germany (2018)
- *Large linear systems of coupled diffusions*, IPAM Financial Mathematics reunion conference, US (2017)**
- *Managing Default Contagion in Inhomogeneous Financial Networks*, CFMAR 10th Anniversary Conference, Santa Barbara, US (2017)**
- *Managing Default Contagion in Financial Networks*, 3rd Berlin-Princeton-Singapore Workshop on Quantitative Finance, Berlin, Germany (2017)**
- *Bootstrap Percolation in Directed Inhomogeneous Random Graphs* AMS Joint Mathematics Meetings, Special Session on Random Matrices, Random Percolation and Random Sequence Alignments, Atlanta, US (2017)**
- *Managing Systemic Risk in Financial Networks*, IPAM Financial Mathematics Reunion Conference I, Lake Arrowhead, US (2016)**
- *Bootstrap Percolation in Directed Inhomogeneous Random Graphs*, Southern California Probability Symposium, Los Angeles, US (2016)**
- *Bootstrap Percolation in Inhomogeneous, Directed Random Graphs and Financial Contagion*, SIAM Conference on Financial Mathematics and Engineering (Mini Symposium *Managing Systemic Risk Based on Network Models*, Austin, US (2016)
- *Managing Systemic Risk In Inhomogeneous Financial Networks*, INFORMS Annual Meeting, Session *Quantitative Methods in Finance*, Nashville, US (2016)**
- *Measuring the model risk of contingent claims*, Frankfurt Institut für Risikomanagement und Regulierung Research Conference, Montabaur, Germany (2016)**
- *Bootstrap percolation in inhomogeneous and directed random graphs*, 7th European Congress of Mathematics, Berlin, Germany (2016)
- *Bootstrap percolation in inhomogeneous, directed random graphs and financial contagion*, Dependence Modeling in Finance, Insurance and Environmental Science, Munich, Germany (2016)
- *Measuring the model risk of contingent claims*, Scientific Morning Conference - "Contingent Claims, Risk and Asset Pricing", Paris, France (2016)**
- *Systemic risk in inhomogeneous random networks*, 12th German Probability and Statistics Days, Bochum, Germany (2016)
- *Bootstrap percolation in inhomogeneous and directed random graphs*, ALEA in Europe Meeting, Munich, Germany (2016)**
- *Bootstrap percolation in inhomogeneous, directed random graphs and financial contagion*, Computational methods for networks, Munich, Germany (2015)**
- *Systemic risk in inhomogeneous random networks*, Cequra Conference, Munich, Germany (2015)
- *Measuring the model risk of quadratic risk minimizing hedging strategies with an application to energy markets*, WPI Mini-Workshop on "Random Fields in Energy and Weather Finance", Vienna, Austria (2014)
- *Pricing and hedging Asian-style options in energy*, Energy Finance, Essen, Germany (2013)
- *Pricing and hedging Asian-style options in energy*, Risk Management Reloaded, Munich,

Germany (2013)
- *Measuring the model risk of contingent claims*, Asia Meeting Econometric Society, Singapore (2013)
- *Measuring the model risk of contingent claims*, Quant Congress USA, New York, US (2013)
- *Measuring the model risk of contingent claims*, Euro Informs Meeting, Rome, Italy (2013)
- *Pricing and hedging Asian-style options in energy*, Advances in Mathematics of Finance - 6th AMaMeF and Banach Center Conference, Warsaw, Poland (2013)
- *Measuring the model risk of contingent claims*, CEQURA Conference on Advances in Financial and Insurance Risk Management, Munich, Germany (2012)
- *Model risk of contingent claims*, SIAM conference on Financial Mathematics and Engineering, Minneapolis, US (2012)
- *Model risk of contingent claims*, 7th world congress Bachelier Finance Society, Sydney, Australia (2012)
- *Model risk based on the distribution of the hedge error*, Mathematical and Statistical Methods for Actuarial Science and Finance, Venice, Italy (2012)
- *Comparing return distributions of equity linked retirement provision plans*, Quantitative Methods in Financial and Insurance Mathematics, Leiden, Netherlands (2011)
- *Return distribution of guarantee concepts for equity linked life insurance products*, Mathematical and Statistical Methods for Actuarial Science and Finance, Ravello, Italy (2010)

Other relevant presentations

(Invited presentations marked with *)
- *Neural Networks in Fréchet spaces*, UCSB Statistics Seminar, Online (2021)
- *Suffocating Fire Sales*, Fields Institute, Canada (2020), Invited seminar talk (2020)*
- *Suffocating Fire Sales*, Steven Institute of Technology, Hoboken, US (2020), Invited seminar talk (2020)*
- *Bootstrap percolation in inhomogeneous and directed random graphs*, University of California Los Angeles, Invited seminar talk (2019)*
- *Managing Default Contagion in Inhomogeneous Financial Networks*, University of Michigan, Invited seminar talk (2019)*
- *Managing Default Contagion in Inhomogeneous Financial Networks*, Illinois Institute of Technology, Invited seminar talk (2019)*
- *Managing Default Contagion in Inhomogeneous Financial Networks*, Johns Hopkins University, Invited seminar talk (2019)*
- *Financial Contagion in a Generalized Stochastic Block Model*, Humboldt University Berlin, Invited seminar talk (2018)*
- *Managing Default Contagion in Inhomogeneous Financial Networks*, University of Augsburg, Invited seminar talk (2018)*
- *Managing Default Contagion in Inhomogeneous Financial Networks*, University of Colorado Boulder, Invited seminar talk (2018)*
- *An Integrated Model of Fire Sales and Default Contagion in Financial Systems*, University of Munich, Invited seminar talk (2018)*
- *Managing Default Contagion in Financial Networks*, University of Oslo, Invited seminar talk (2017)*
- *Managing Default Contagion in Financial Networks*, University of Southern California,

Invited seminar talk (2017)*
- *Managing Default Contagion in Financial Networks*, California Polytechnic State University, Invited seminar talk (2017)*
- *Bootstrap percolation in inhomogeneous, directed random graphs and financial contagion*, Department of Statistics and Applied Probability, University of California Santa Barbara (2016)*
- *Overview talk on own research*, Institute for Pure and Applied Mathematics, University of California Los Angeles (2015)
- *Pricing and hedging Asian-style options in energy*, LMU/TUM, Seminar talk (2014)*
- *Pricing and hedging Asian-style options in energy*, University of Oslo, Invited seminar talk (2013)*
- *Measuring the model risk of contingent claims*, University of Oslo, Seminar talk (2012)*
- *Measuring the model risk of contingent claims*, PhD Workshop of the Annual Meeting of the German Finance Association (2012)

Workshop /Conference organization

- **Invited Session Organizer** *Recent Developments on Modeling Financial Systemic Risk*, INFORMS Annual Meeting, Anaheim, California US (2021)
- **Invited Session Organizer** *Systemic Risk*, SIAM Annual Meeting, Spokane Convention Center, Washington US (2021)
- **Conference Organizer** *Western Conference on Mathematical Finance*, Virtual (2021)
- **Focused Research Group Organizer** *Analytical Methods for Financial Systemic Risk* Banff International Research Station, Canada (2019)
- **Invited Session Organizer** *Systemic Risk*, Informs Annual Meeting Seattle, US (2019)
- **Mini Symposium Organizer** *Managing Systemic Risk Based on Network Models*, SIAM Conference on Financial Mathematics and Engineering Austin, US (2016)

University and Department Service

- Undergraduate Diversity, Equity, and Inclusion Officer: 21-22
- University Central Fellowship Review Committee: Academic years: 19-20
- Program Review, Undergraduate Subcommittee: Academic years: 18-19
- UG Advisor/Curriculum Committee: Academic years: 18-19, 19-20, 20-21, 21-22
- Actuarial Program Committee: Academic years: 18-19
- Hiring Committee Data Science/Computational Probability: Academic years: 19-20
- Hiring Committee Act. Science: Academic years: 18-19
- Seminar Organizer: Academic years: 17-18
- Hiring Committee Probability: Academic years: 17-18
- Qualifying Exam Probability, Academic years: 16-17, 17-18, 18-19
- Library Liaison: Academic years: 16-17

Reviewing activities

- SIAM Journal on Financial Mathematics (7)
- Mathematical Methods of Operations Research (2)
- Management Science (2)
- Mathematical Finance (3)

- Finance and Stochastic (2)
- Operations Research (1)
- Operations Research Letter (1)
- Decisions in Economics and Finance (1)
- Mathematics and Financial Economics (1)
- Quantitative Finance (1)
- Journal of Banking & Finance (1)
- Annals of Finance (1)

Scholarships Awards

- 2016 Research prize (3rd place) of the Frankfurt Institut für Risikomanagement und Regulierung (FIRM)
- Fellow at the Institute for Pure and Applied Mathematics (IPAM) (Spring 2015 Program on Broad Perspectives and New Directions in Financial Mathematics)
- Funded Program Participant at the Isaac Newton Institute, University of Cambridge (Program: Systemic Risk: Mathematical Modelling and Interdisciplinary Approaches)
- Academic paper winner, Quant Congress USA, New York, (June 2013)
- DAAD(German academic exchange service) PhD Exchange Scholarship for research stay at the Centre of Mathematics for Applications at the University of Oslo (July 2012 - December 2012)
- Travel Award of the Society of Industrial and Applied Mathematics to attend the meeting on Financial Engineering in Minneapolis (July 2012)
- Sokrates Erasmus Scholarship for exchange year in Sweden (August 2004 - June 2005)

Languages

German (native), English (fluent), Norwegian and Swedish (basic)