

# DR. FARHAN FEROUZ

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**Google Scholar** <http://goo.gl/1sQdFf>

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## PERSONAL PROFILE

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I am an expert in statistical inference with extensive experience of developing and applying novel statistical and machine-learning methods for the analysis of data-sets in many diverse areas. I have published over 80 papers, mostly on statistical data analysis. Outside academia I have been working in the financial industry, initially for an algo trading spin-off from Cambridge then as a front office quant at Citi and Winton Capital and now at UBS.

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## EXPERIENCE

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- July 2017 – Present **Electronic FX Quantitative Trader**  
UBS, UK
- Development of quantitative trading algorithms for electronic spot FX and NDFs using Bayesian inference and machine learning techniques.
- 2014 – Present **Visiting Researcher**  
Cavendish Astrophysics, University of Cambridge, UK
- Working on various project involving Deep Learning and Bayesian inference.
- 2016 – 2017 **Vice President - Research**  
Winton Capital Management, UK
- Development of intraday mean reversion strategies for Futures and FX using Bayesian inference.
  - Analysis of different momentum signals for long and short equities.
  - Aggregation of Earnings per Share (EPS) forecasts using deep learning.
- 2014 – 2016 **Quantitative Analyst**  
Citigroup Global Markets Limited, UK
- Credit quantitative analysis
  - Estimation of credit curves using robust statistical techniques for CCR/CVA calculations.
  - Development of models for the pricing of bonds and credit derivatives using stochastic calculus as well as statistical and machine learning techniques.
  - Estimation of impact of moves in equity indexes and oil to credit markets.
- 2012 – 2014 **Quantitative Analyst**  
SCAR Ltd., UK
- Financial trading spin-off from the University of Cambridge
  - Development of realistic market simulation environment for accurate backtesting of strategies trading FX and futures.
- 2008 – 2014 **Research Fellow**  
Cavendish Astrophysics, University of Cambridge, UK
- Funded initially by a Junior Research Fellowship from Trinity Hall and then by Leverhulme/Newton Trust Research Fellowship.
  - Independent research programme on the theme of 'Statistical Inference and Machine Learning in Astrophysics & Cosmology'.
  - Developed and applied several Monte Carlo and Bayesian methods for the detection of various types of astronomical sources from large noisy data-sets.
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## EDUCATION

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- 2005 – 2008     **PhD in Astrophysics, University of Cambridge, UK**  
Thesis: Bayesian Methods for Astrophysics and Particle Physics
- 2004 – 2005     **Master of Advanced Study in Mathematics, University of Cambridge, UK**  
Major: Astrophysics
- 1999 – 2003     **BS (Computer Science), University of Karachi, Pakistan**  
Final Year Grade Point Average (GPA): 3.9/4.0
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## FELLOWSHIPS & AWARDS

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- 2015            **Royal Society University Research Fellowship** (declined)  
offered by the Royal Society for 2015 – 2020
- 2012            **Leverhulme/Newton Trust Early Career Research Fellowship**  
Awarded by Leverhulme/Newton Trust for 2012 – 2015
- 2012            **Assistant Professor of Astrophysics & Statistics** (declined)  
Pennsylvania State University
- 2011            **Scopus UK Young Researcher Award in Physical Sciences**  
Awarded by Elsevier, in association with the Fulbright Commission
- 2010            **Salje Medal for best Science PhD**  
Awarded by Clare Hall College, University of Cambridge
- 2009 – 2012    **Junior Research Fellowship in Astrophysics**  
Awarded by Trinity Hall, Cambridge
- 2009            **Royal Commission for the Exhibition 1851 Research Fellowship** (declined)  
Offered for 2009 – 2012 to be taken at Imperial College London
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## SELECTED INVITED TALKS

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- Mar 2018        Bayesian Inference & Machine Learning for High Frequency Market Making, QuanTech Conference, London, UK
- Oct 2017        Bayesian Inference & Deep Learning in Astrophysics, Royal Observatory Edinburgh, UK
- Dec 2016        Bayesian Inference with Nested Sampling in Astrophysics, Conference on Computational & Methodical Statistics, University of Seville, Spain
- Jun 2016        Statistics, Machine Learning & the Detection of Gravitational Waves, Conference on Uncertainty in Artificial Intelligence (UAI), New York, USA
- Feb 2016        Bayesian Inference & Deep Learning in Astrophysics, Princeton University, USA
- Nov 2015        Detecting Exoplanets with Bayesian Inference, University of Geneva Seminar, Switzerland
- Nov 2015        Performing Bayesian Model Selection with Nested Sampling, 1st PlanetS workshop on Bayesian Statistics, Bern, Switzerland
- Sep 2014        Multi-Modal Nested Sampling, Royal Statistical Society 2014 International Conference, Sheffield, UK
- Jul 2014        Bayesian Source Detection, Science on the Sphere Royal Society Meeting, UK
- Jun 2014        Detecting Exoplanets using Bayesian Object Detection, Institute of Astronomy Exoplanets Meetings, Cambridge, UK
- Feb 2014        An Analyst's View of Modern Astrophysics, Johns Hopkins University, USA
- Dec 2013        Calculation & Applications of Bayesian Evidence in Astrophysics, IEEE International Conference on Data Mining, Dallas, USA
- Mar 2013        The MultiNest Algorithm & its Applications, CosmoStats 2013, Banff, Alberta, Canada
- Oct 2012        Bayesian Inference & Machine Learning in Astrophysics, University of Birmingham, UK
- Oct 2012        Nets and Nests: Accelerated Bayesian Inference in Astrophysics and Cosmology, Mathematics Department, University of Warwick, UK
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Aug 2012	Probabilistic Source Detection, Imperial Centre for Inference & Cosmology Inaugural Workshop, UK
Jun 2012	Recent Developments in Practical Statistical Inference, Stockholm, Sweden
Apr 2012	Bayesian Object Detection in Astrophysics, Penn State Astrophysics, USA
Feb 2012	Nets & Nests: Accelerated Bayesian Inference in Astrophysics, Penn State Statistics, USA
Nov 2011	Searching for Dark Matter with MultiNest, University of Amsterdam, Netherlands
Mar 2011	Statistical Methods for Astrophysics and Beyond, Imperial College London, UK
Sep 2010	MultiNest for Particle Physics Phenomenology, Dark Matter Workshop, Zurich, Switzerland
Jun 2009	Bayesian Object Detection in Astrophysics, Imperial College London, UK
Dec 2008	Predictions for Protein Folding, STFC Kite Club, London, UK
Sep 2008	Applications of MultiNest in Astrophysical Object Detection, Nested Sampling Workshop, Cavendish Lab, Cambridge, UK
Aug 2008	Bayesian Analysis Methods for SKA, SKA Workshop, Cavendish Lab, Cambridge, UK
Apr 2008	Constraining Cluster Physics from Multi-Wavelength Cluster Data, IoA, Cambridge, UK
Nov 2007	Multi-Modal Nested Sampling, University of Sussex, UK
Oct 2007	Statistical Inference in Astrophysics and Cosmology, University College London, UK
Jul 2007	Multi-Modal Nested Sampling for Astrophysical Data Analysis, Santander, Spain

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## SOFTWARE DEVELOPED

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| 2007 - Present | <p><b>MultiNest</b> (<a href="http://www.mrao.cam.ac.uk/software/multinest">http://www.mrao.cam.ac.uk/software/multinest</a>)<br/> This is the C/Fortran implementation of a Monte Carlo technique I have developed for the Bayesian analysis of complex data-sets. MultiNest has been applied to numerous data analysis problem in physics and beyond, resulting in more than 1500 published papers, and has hundreds of active users.</p> |
| 2008 - Present | <p><b>SuperBayeS</b> (<a href="http://www.superbayes.org">http://www.superbayes.org</a>)<br/> I am one of the main authors of this package for fast and efficient Monte Carlo sampling of supersymmetric theories in particle physics.</p>  |
| 2011 - Present | <p><b>BAMBI</b> (<a href="http://www.mrao.cam.ac.uk/software/bambi">http://www.mrao.cam.ac.uk/software/bambi</a>)<br/> This is a C++/Fortran implementation of BAMBI algorithm for rapid Bayesian analysis that combines the benefits of statistical inference done using nested sampling with artificial neural networks.</p>  |
| 2011 - Present | <p><b>SkyNet</b> (<a href="http://www.mrao.cam.ac.uk/software/skynet">http://www.mrao.cam.ac.uk/software/skynet</a>)<br/> This is a C++ library for training very deep feed-forward recurrent neural networks using 2<sup>nd</sup> order optimization methods built around the conjugate-gradients algorithm.</p>   |
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## PROFESSIONAL ACTIVITIES

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- Published around 80 papers in peer-reviewed scientific journals (6600 total citations, h-index = 39), full list can be found at <http://www.mrao.cam.ac.uk/~ff235/publications.html>
  - Referee for Nature Astronomy, Monthly Notices of the Royal Astronomical Society (MNRAS), Astronomy and Astrophysics (A&A), Astrophysical Journal (ApJ), Journal of Cosmology and Astroparticle Physics (JCAP), Statistical Analysis and Data Mining (SAM), Statistics and Computing (STCO), Connection Science (CSN), BMC Systems Biology (BMC Syst. Biol.)
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## ADDITIONAL QUALIFICATIONS

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| <b>Mathematical Skills</b>  | <ul style="list-style-type: none"> <li>• Bayesian Statistics, Machine Learning/Deep Learning, Time Series Analysis, Predictive Analytics, Numerical Analysis</li> </ul>   |
| <b>Computer Proficiency</b> | <ul style="list-style-type: none"> <li>• Operating Systems: Linux, MS Windows, Sun Solaris</li> <li>• Programming Languages: C, C++, Python, Fortran, Shell scripting</li> <li>• Scientific Computing: Parallel programming using OpenMP and MPI, Spark, Kdb</li> </ul> |
| <b>Languages</b>            | <ul style="list-style-type: none"> <li>• English: fluent</li> <li>• Urdu: fluent</li> </ul>   |
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