

## Dean Adam Bodenham

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Nationality: British  
Date of birth: 17 November 1984

### WORK EXPERIENCE

- Jan 2020–present      Lecturer in Statistics, Department of Mathematics,  
Imperial College London
- Feb 2019–Dec 2019      Strategic Teaching Fellow in Statistics, Department of Mathematics,  
Imperial College London
- April 2018–Jan 2019      Postdoctoral researcher at RIKEN AIP, Japan, in the Structured Learning Team of  
Prof. Yoshinobu Kawahara
- Oct 2014–Sep 2017      Postdoctoral researcher at ETH Zürich, in the Machine Learning and Computational  
Biology Group of Prof. Karsten Borgwardt
- Nov 2013–July 2014      Statistician at Mentat Innovations Ltd. Worked on projects related to streaming  
data change detection and streaming classification with decision trees.

### EDUCATION

- 2010–2014      **PhD in Statistics, Imperial College London**  
Thesis: *Adaptive estimation with change detection in streaming data*  
(Supervisors: Prof. Niall Adams, Prof. Nicholas Heard)
- 2008–2009      **MASt in Mathematics, University of Cambridge**  
Part III of the Mathematical Tripos, Magdalene College
- 2007–2008      **MSc in Mathematics, University of Cape Town**  
Thesis: *Exotic 4-manifolds* (arXiv:0812.1883)
- 2003–2006      **BSc (Honours) in Mathematics, University of Cape Town**  
BSc (Honours) in Mathematics, *First Class* (2006)  
  
BSc in Mathematics and Applied Mathematics, *with Distinction* (2005)  
with coursework in Computer Science, Physics and Statistics

### RESEARCH ARTICLES

*Interests: Statistics, Changepoint Detection, Bioinformatics, Cybersecurity*

- 2018      F. Llinares-López, L. Papaxanthos, D. Roqueiro, D. A. Bodenham and K. Borgwardt, “CASMAP: detection of statistically significant combinations of SNPs in association mapping”, *Bioinformatics*, doi:10.1093/bioinformatics/bty1020
- 2017      D. A. Bodenham and N. M. Adams, “Continuous monitoring for changepoints in data streams using adaptive estimation”, *Statistics and Computing*, 27, 5, 1257–1270
- 2017      F. Llinares-López, L. Papaxanthos, D. A. Bodenham, D. Roqueiro and K. Borgwardt, “Genome-wide genetic heterogeneity discovery with categorical covariates” *Bioinformatics*, 33, 12, 1820-1828
- 2016      D. A. Bodenham and N. M. Adams, “A comparison of efficient approximations for a weighted sum of chi-squared random variables in a sequential analysis context”, *Statistics and Computing*, 26, 4, 917–928
- 2016      L. Papaxanthos, F. Llinares-López, D. A. Bodenham and K. Borgwardt, “Finding significant combinations of features in the presence of categorical covariates”, *Advances in Neural Information Processing Systems (NIPS) 2016*
- 2015      F. Llinares-López, D. G. Grimm, D. A. Bodenham, U. Gieraths, M. Sugiyama, B. Rowan, and K. Borgwardt “Genome-wide detection of intervals of genetic heterogeneity associated with complex traits”, *Bioinformatics* (Special Issue: ISMB/ECCB 2015 Proceedings Papers), 31, 12, i240–i249

## RESEARCH ARTICLES (CONTINUED)

- 2014 D. A. Bodenham and N. M. Adams, “Adaptive change detection for relay-like behaviours”, *2014 IEEE Joint Intelligence and Security Informatics Conference (JISIC)*, 252-255
- 2013 D. A. Bodenham and N. M. Adams, “Continuous monitoring of a computer network using multivariate adaptive estimation”, in *ICDM Workshop on Data Mining in Networks, 2013 IEEE 13th International Conference on Data Mining*, 311-318

## PREPRINTS AND WORKING PAPERS

- 2019 D. A. Bodenham and Y. Kawahara, “EMMD: An efficient computation of the MMD two-sample test statistic”, *in preparation*
- 2019 D. A. Bodenham and K. Borgwardt, “Efficient nonparametric detection of change-points in sequences containing extreme outliers”, *in preparation*
- 2019 D. A. Bodenham, “Fast nonparametric changepoint detection for univariate data”, *in preparation*
- 2019 D. A. Bodenham and R. P. Monti, “Scalable nonparametric independence testing with applications to high-dimensional causal discovery”, *in preparation*
- 2019 D. A. Bodenham and N. M. Adams, “Continuous monitoring for changes in variance in streaming data”, *in preparation*

## SOFTWARE – R PACKAGES

- 2018 CASMAP (<https://CRAN.R-project.org/package=CASMAP>)
- 2016 ffstream (<https://CRAN.R-project.org/package=ffstream>)
- 2016 fastcmh (<https://CRAN.R-project.org/package=fastcmh>)
- 2015 momentchi2 (<https://CRAN.R-project.org/package=momentchi2>)

## CONFERENCES AND WORKSHOPS: WORK PRESENTED

- 2016 *NIPS 2016*, Barcelona, 5–10 December
- 2015 *NIPS 2015, MLCB Workshop*, Montreal, 7–12 December
- 2015 *Intelligent Systems in Molecular Biology (ISMB) 2015*, Dublin, 10–14 July
- 2014 *IEEE Joint Intelligence and Security Informatics Conf.*, Den Haag, 24–26 Sept.
- 2013 *IEEE International Conference on Data Mining, Data Mining in Networks Workshop*, Dallas, Texas, 7–10 December
- 2013 *Data Analysis for Cyber Security Workshop*, University of Bristol, 25 – 26 March
- 2012 *Recent Advances in Changepoint Analysis*, University of Warwick, 26 – 28 March

## INVITED SEMINAR TALKS

- 2017 *Recent approaches to significant pattern mining in genetics*, University of Basel, Basel, 6 April
- 2017 *Change detection in streaming data with applications to cybersecurity and healthcare*, Universidad Carlos III de Madrid, Madrid, 30 March
- 2016 *Detecting changes in streaming data using adaptive estimation*, Imperial College London, London, 18 November
- 2016 *Ten Things I Wish I Knew When I Started My PhD*, Imperial College London, London, 17 November
- 2016 *Genome-wide detection of regions of genetic heterogeneity associated with complex traits*, Institut Curie, Paris, 8 July

## TEACHING EXPERIENCE

2019–present	Developing new first-year module MATH40005 (2nd term). Full responsibility Co-supervision of PhD student, Jerome Wynne, starting in Oct 2019 Supervision of M2R project Co-supervision Student Shapers projects Involvement in online MSc Marking M1S1 and M2S2 exams Marking M2R/M3R/M4R reports and oral presentations Department of Mathematics, Imperial College London
2016–2017	Co-supervision of master's and PhD student Department of Biosystems Science and Engineering, ETH Zürich
2015–2016	Teaching assistant, <i>Data Mining I and II</i> Design of homework sheets and assignments, presentation of problems classes Topics included: <i>Decision trees, LDA, Naive Bayes, Logistic regression, k-nearest neighbours, k-means clustering, kernel PCA, Support Vector Machines</i> Design and delivery of one-day <i>Introduction to Python</i> course Design and marking of examinations Department of Biosystems Science and Engineering, ETH Zürich
2013	Teacher, One-day <i>Introduction to R</i> course Imperial College London
2010–2013	Demonstrating and marking, Courses: <i>Statistical Pattern Recognition, Mathematical Methods, Complex Analysis, Metric Spaces and Topology, Probability and Statistics I</i> Department of Mathematics, Imperial College London
2009	Designed and delivered four-day <i>Introduction to knot theory</i> course University of Cambridge-Linyi Normal University Summer School Linyi, Shandong Province, China Faculty of Mathematics, University of Cambridge
2005–2007	Tutor, <i>Calculus I and II</i> Department of Mathematics and Applied Mathematics University of Cape Town

## SCHOLARSHIPS, AWARDS AND PRIZES

2010–2014	Roth Studentship, Imperial College London
2013	Best PhD poster in the Statistics Section, Imperial College London
2011	Faculty of Natural Sciences Award for Excellence in Teaching, Imperial College London
2008	Scarce Skills Master's Scholarship, National Research Foundation, South Africa
2003–2005	Entrance Scholarship, University of Cape Town

## SKILLS

Programming/IT	R (expert), Python, C++, Java, L <sup>A</sup> T <sub>E</sub> X
Languages	English (native), Italian (basic), German (basic)

## CONSULTING WORK

2013, April	Worked with Mentat Innovations Ltd. on a project related to streaming data.
2013, March–July	Co-authored an online <i>Introduction to Statistics</i> course for a UK government agency.

## REVIEWING WORK

2014–2019	NIPS/NeurIPS, JMLR, ICML, Machine Learning, KDD, AISTATS, IEEE TPAMI, Annals of Applied Statistics, OUP Bioinformatics, BMC Bioinformatics, MASAMB, IDA, ISMB, JISIC, Technometrics, Data Mining and Knowledge Discovery
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