

# Alexis Boukouvalas

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## Research experience and Education

- 2015-present: Senior research associate, Informatics, Imaging & Data Sciences, School of Health Sciences, University of Manchester.
- 2012-2015: Research fellow in the Aston research centre in healthy ageing, Aston University.
- 2011-2012: Research associate in the managing uncertainty in complex models project, Aston University.
- 2007-2011: PhD, statistics and information Engineering, Aston University. 'Emulation of random output simulators.'
- 1999-2006: Software design engineer in the query processor of SQL Server, Microsoft Corp.
- 1996-1999: BSc in software engineering, first class, University of Newcastle Upon Tyne.

## Awards & Honorary posts

- 2016-2018: Visiting research fellow, School of Engineering and Applied Science, University of Aston.
- 2016: Wellcome Trust institutional strategic support fund for 'Can pseudotime gene network reconstruction from single cell RNA-seq data be used to determine how cell fate choices are made?'(named contributor).
- 2015: EPSRC NCSML PDRA Challenge Award (£2000), 'Bayesian nonparametric modelling of computer experiments: A tsunami case study', with Joakim Beck, University College London.
- 2015: Horizon 2020 European Grant on 'Frailty management Optimisation through EIP AHA Commitments and Utilisation of Stakeholders input ', (Grant number SEP-210203667) (£1.8 Million, named contributor).
- 2015: NHS Regional Capacity Management Team (RCMT) grant (£50000), 'Demand forecasting for Emergency Departments'.
- 2014: EPSRC NCSML PDRA Challenge Award (£2000), 'Bayesian Non-Parametrics for longitudinal data: A predictive study of the temporal progression of Alzheimer's disease', with Sara Wade (University of Cambridge). Project number 56449.
- 1999: British Airways Award for outstanding performance in a computer science undergraduate programme, 1998-1999.

## Journal publications

† joint first authors.

- Raykov, Y.<sup>†</sup>, *Boukouvalas, A.*<sup>†</sup>, Baig, F., Little, M. A., ‘What to do when K-means clustering fails: a simple yet principled alternative algorithm’. PLoS one 11.9, 2016.
- Raykov, Y.<sup>†</sup>, *Boukouvalas, A.*<sup>†</sup>, Little, M. A., ‘Simple approximate MAP inference for Dirichlet process mixtures’. Electronic journal of statistics, special issue on Bayesian nonparametrics, 10.2, 3548–3578, 2016.
- Holland, C., *Boukouvalas, A.*, Wallis, S., Clarkesmith, D., Liddell, L., Kay, A., ‘Transition from community dwelling to retirement village in older adults: cognitive functioning and psychological health outcomes.’ Ageing and Society, 1–28, 2016.
- Pararasa, C., Ikwuobe, J., Shigdar, S., *Boukouvalas, A.*, Nabney, I. T., Brown, J. E., Devitt, A., Bailey, C. J., Bennett, S. J., Griffiths, H. R., ‘Age-associated changes in long chain fatty acid profile during healthy ageing promote pro-inflammatory monocyte polarisation via PPAR $\gamma$ ’. Aging Cell. 5(1):128–139, 2016.
- Sakel, M., *Boukouvalas, A.*, Buono, R., Moten, M., Mirza, F., Chan, W., Maidment, I., Cross, J., Smith, T., Myint, P. K., Fox, C., ‘Does anticholinergics drug burden relate to global neurodisability outcome measures and length of hospital stay?’, Brain injury, 29(12), 1426–1430, 2015.
- *Boukouvalas, A.*, Sykes, P., Cornford, C., Maruri-Aguilar H. ‘Bayesian Precalibration of a Large Stochastic Microsimulation Model’. IEEE Transactions on Intelligent Transportation Systems, 1–11, 2014.
- *Boukouvalas, A.*, Gosling, J. P., Maruri-Aguilar, H. ‘An efficient screening method for computer experiments’. Technometrics, 56(4), 422–431, 2014.
- *Boukouvalas, A.*, Cornford, D. Stehlik, M. ‘Optimal design for correlated processes with input-dependent noise’. Computational Statistics & Data Analysis, 71(0):1088–1102, 2014.
- Brownlie, K., Fox, C. G., Schneider, C., *Boukouvalas, A.*, Culliford, R., Willan, C. and Maidment, I., ‘Medication reconciliation by a pharmacy technician in a mental health assessment unit’. International journal of clinical pharmacy 36 (2), 303–309, 2014.

## Peer-reviewed conference publications and preprints

- Matthews, A., Wilk, M., Nickson, T., Fujii, K. *Boukouvalas, A.*, León-Villagr a, P., Ghahramani, Z. and Hensman, J., ‘GPflow: A Gaussian process library using TensorFlow’, arXiv:1610.08733, 2016.
- Raykov, Y. P., Ozer, E., Dasika, G., *Boukouvalas, A.* Little., M.A., ‘Predicting room occupancy with a single passive infrared (PIR) sensor through behavior extraction.’, 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp): Heidelberg, Germany, 2016.
- Raykov, Y., *Boukouvalas, A.*, Little M. A., ‘Iterative collapsed MAP inference for Bayesian nonparametrics’, NIPS Workshop on ‘Bayesian Nonparametrics: The Next Generation’, 2015.
- Raykov, Y., *Boukouvalas, A.*, Little M. A., ‘MAP for Exponential Family Dirichlet Process Mixture Models’, NIPS Workshop on ‘Nonparametric Methods for Large Scale Representation Learning’, 2015.

- *Boukouvalas, A., Barillec R., Cornford, D.* ‘Gaussian process quantile regression using expectation propagation’. In John Langford and Joelle Pineau, editors, Proceedings of the 29th International Conference on Machine Learning, 1695–1702, 2012.
- *Boukouvalas, A., Cornford, D., Singer, A.* ‘Managing uncertainty in complex stochastic models: Design and emulation of a rabies model’. In 6th St. Petersburg Workshop on Simulation, 839–841, 2009.
- *Boukouvalas, A., Cornford, D.*, ‘Learning heteroscedastic Gaussian processes for complex datasets’. Technical report NCRG/2009/001, Neural Computing Research Group, Aston University, Birmingham, UK, 2009.

## Selected invited and contributed talks

- ‘Identification of branching using pseudotime estimation’, Mathematical and Statistical Aspects of Molecular Biology, University of Cambridge, 2016.
- ‘Identification of branching using pseudotime estimation’, Computational Challenges in Biochemical Networks: Multiscale Modelling and Inverse Problems, University of Manchester, 2016.
- ‘Optimal experimental design for heteroscedastic Gaussian processes’, SIAM conference on uncertainty quantification, Lausanne, 2016.
- ‘Gaussian Process Quantile Regression using Expectation Propagation’, International Conference on Machine Learning, Edinburgh, 2012.
- ‘Optimal Design under Heteroscedasticity for Gaussian Process Emulators with replicated observations’, Designed Experiments: recent advances in Methods and Applications (DEMA), Cambridge, 2011.
- ‘Sequential screening with elementary effects’, Accelerating Industrial Productivity via Deterministic Computer Experiments & Stochastic Simulation, Cambridge, 2011.
- ‘Gaussian process emulation of stochastic models: developments and application to rabies modelling’, Royal Statistical Society Conference, Nottingham, 2008.
- ‘Designs for screening in computer experiments’, Royal Statistical Society Conference, Nottingham, 2008.

## Teaching Experience

### University of Manchester

- 2016: Co-supervisor of two PhD students on single-cell computational biology projects.
- 2016: Single-cell analysis lecture for higher specialist scientist training doctoral-level programme.
- 2016: MSc in bioinformatics lecture on visualising high dimensional data using non-linear methods.

### Aston University:

- 2014: Revision lectures for the undergraduate course on Statistical Pattern Analysis.

- 2011-2013: Lecturer for probabilistic modelling MSc course.
- 2011: Co-supervisor MSc project on Gaussian processes with categorical inputs.
- 2011: Co-supervisor BSc final year project on GPS smartphone application.
- 2009-2010: Teaching linear Algebra and transition mathematics for engineers.

## Industry white papers and patents

- *Boukouvalas, A., He, G., Fokina, L., Sztajno, M., Verkhedkar, S., Mishra, S., Guy, W., Erickson, G.* 'Online Index Operations'. Microsoft SQL Server, Technical Article, March 2007.
- Patent 7376656, Filed 02/2004, Issued 5/2008, Blakeley, J. A., Zhang, H., Rathakrishnan, B., Venkatesh, R., Sezgin, B., *Boukouvalas, A.*, Galindo-Legaria, C. A., Carlin, P. A., 'System and method for providing user defined aggregates in a database system', Microsoft Corporation, 2008.
- Patent 7167848, Filed 11/2003, Issued 1/2007, *Boukouvalas, A.*, Kollar, L. J., Liu, J., Marathe, A. P., 'Generating a hierarchical plain-text execution plan from a database query', Microsoft Corporation, 2007.