

# Matteo Fasiolo

## Curriculum Vitae

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### Work

- Feb 2018– **EPSRC Doctoral Prize Fellow**, University of Bristol.  
Current Research focus: additive quantile regression, functional additive models, multi-resolution electricity load forecasting.  
Mentor: Simon N. Wood.
- 2015–2018 **Post-doctoral Research Associate**, University of Bristol.  
Research focus: additive models, quantile regression, electricity load forecasting.  
Advisor: Simon N. Wood.
- 2014–2015 **Post-doctoral Research Assistant**, University of Liverpool.  
Research focus: particle filters, adaptive importance sampling, Langevin MCMC.  
Advisor: Simon Maskell.

### Education

- 2011–2016 **PhD, Statistics**, University of Bath.  
Thesis title: Statistical Methods for Complex Population Dynamics.  
Supervisor: Simon N. Wood.
- 2010-2011 **MSc, Financial Eng.**, Birkbeck College, Mark: Distinction.
- 2008-2010 **MEng, Industrial Management Eng.**, University of Udine, Mark: 110/110.
- 2004-2008 **BEng, Industrial Management Eng.**, University of Udine, Mark: 106/110.

### Collaborations

- 2017– **University of Tübingen, Department of Linguistics.**  
current Collaborating with quantitative linguists interested in using mixed-effect quantile GAMs to analyse the results of psycholinguistic experiments.
- 2015– **Électricité de France.**  
current Working on additive quantile regression for short/middle term load forecasting. Accurate forecasts are essential for efficient electricity production planning.
- 2013–2015 **Bristol Heart Institute.**  
Collaborated with a group of cardiologists at BHI, who were interested in predicting the occurrence of different heart conditions on the basis of a number of risk factors.
- 2009–2010 **Regional Health Agency of Friuli Venezia Giulia.**  
Used semi-parametric mixed models to identify which factors determine the type of surgery that patients with breast cancer undergo.

## Software

I am the author of the following open-source R packages, all available on CRAN:

- qgam methods for fitting additive quantile regression models. Substantial extension of the *mgcv* R package.
- mgcViz interactive visualization methods for Big Data Generalized Additive Models.
- synlik object-oriented (S4) framework and tools for performing synthetic likelihood inference for models where the likelihood function is unavailable or intractable.
- esaddle tools for fitting the extended empirical saddlepoint density.
- mvnfast fast parallel tools related to multivariate normal and student's t densities. Performance achieved using C++, OpenMP and a parallel cryptographic RNG.

## Programming skills

- R-Project
  - Monte Carlo algorithms implementation; regression-based data analysis; S4 programming; debugging and profiling; multicore computation; C, C++ and Cuda-C interfacing; creating interactive visualizations via shiny.
- HPC
  - CUDA-C or OpenMP parallel programming; C++ STL; C++ Armadillo linear algebra library; running jobs on super-computers via PBS.

## Invited talks

- Mar 19: seminar on quantile GAMs for load forecasting at ValPred CNRS Workshop.
- Mar 19: overview of GAMs for electricity demand forecasting at RiskDay 2019 conference.
- Feb 19: seminar on electricity demand forecasting as part of "The mathematics of energy systems" focus group at INI, Cambridge.
- Dec 18: seminar on Extended Empirical Saddlepoint at CFE conference in Pisa.
- Nov 18: seminar on computation methods for quantile GAMs at the University of Glasgow.
- Sept 18: seminar on GAMLSS and quantile GAM models for electricity demand forecasting at the ENBIS conference in Nancy.
- May 18: seminar on quantile GAMs at the University of Warwick.

## Training courses

- Aug 19: full-day course on GAM modelling at University of Bozen.
- Jun 19: full-day course on GAM modelling at the Royal Statistical Society.
- Sept 18: half-day course on GAM modelling at ENBIS-18 in Nancy.
- July 18: half-day course on GAM modelling at UseR18 in Brisbane.
- June 18: full-day course on GAM modelling at Jean Golding Institute data week in Bristol.
- May 18: full-day course on quantile GAMs at the University of Leeds.
- Oct 17: half-day course on interactive visualization tools for GAMs at EDF labs in Paris.
- Jan 2017: half-day workshop on quantile GAMs of the University of Tübingen.

## Teaching

- 2016-2017 Delivered tutorials on Linear Algebra, Probability and Statistics to 1st year students at the University of Bristol.
- 2012/2014 Delivered tutorials on 1st year Statistics and on Stochastic Processes to 2nd year students at the University of Bath.

## Publications in Statistics

- **Fasiolo, M.**, Nedellec, R., Goude, Y. and Wood, S.N., 2018. Scalable visualisation methods for modern Generalized Additive Models. *Journal of Computational and Graphical Statistics* (in press). arXiv preprint arXiv:1809.10632.
- **Fasiolo, M.**, Goude, Y., Nedellec, R. and Wood, S. N., 2017. Fast calibrated additive quantile regression. Submitted. arXiv:1707.03307.
- **Fasiolo, M.**, de Melo, F.E. and Maskell, S., 2018. Langevin incremental mixture importance sampling. *Statistics and Computing*, 28(3), pp.549-561.
- **Fasiolo, M.**, Wood, S.N., Hartig, F. and Bravington, M.V., 2018. An extended empirical saddlepoint approximation for intractable likelihoods. *Electronic Journal of Statistics*, 12(1), pp.1544-1578.
- **Fasiolo, M.** and Wood, S.N., 2018. ABC in ecological modelling. In *Handbook of Approximate Bayesian Computation* (pp. 597-622). Chapman and Hall/CRC.
- Wood, S.N. and **Fasiolo, M.**, 2017. A generalized Fellner-Schall method for smoothing parameter optimization with application to Tweedie location, scale and shape models. *Biometrics*, 73(4), pp.1071-1081.
- **Fasiolo, M.**, Pya, N. and Wood, S. N., 2016. A comparison of inferential methods for highly nonlinear state space models in ecology and epidemiology. *Statistical Science*, 31(1), p.96-118.

## Other scientific publications

- Noacco V., Duffy C. J., Wagener T., Worrall F., **Fasiolo M.** and Howden N. J. K., 2019. Drivers of inter- and intra-annual variability of dissolved organic carbon concentration in the River Thames between 1884 and 2013. *Hydrological Processes* (in press).
- Tomaschek, F., Tucker, B.V., **Fasiolo, M.** and Baayen, R.H., 2018. Practice makes perfect: The consequences of lexical proficiency for articulation. *Linguistics Vanguard*, 4(s2).
- Ahmed, N., Frontera, A., Carpenter, A., Cataldo, S., Connolly, G.M., **Fasiolo, M.**, Cripps, T., Thomas, G., Diab, I. and Duncan, E.R., 2015. Clinical predictors of pacemaker implantation in patients with syncope receiving implantable loop recorder with or without ECG conduction abnormalities. *Pacing and Clinical Electrophysiology*, 38(8), pp.934-941.
- Frontera, A., Carpenter, A., Ahmed, N., **Fasiolo, M.**, Nelson, M., Diab, I., Cripps, T., Thomas, G. and Duncan, E., 2015. Demographic and Clinical Characteristics to Predict Paroxysmal Atrial Fibrillation: Insights from an Implantable Loop Recorder Population. *Pacing and Clinical Electrophysiology*, 38(10), pp.1217-1222.
- Frontera, A., Carpenter, A., Ahmed, N., **Fasiolo, M.**, Diab, I., Cripps, T., Thomas, G. and Duncan, E., 2014. Prevalence and significance of early repolarization in patients presenting with syncope. *International journal of cardiology*, 176(1), pp.298-299.