

# Pete Bunch

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## SUMMARY AND SKILLS

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Devising and applying statistical models to glean insights from data inspires me. I have diverse experience solving statistical problems in varied domains, from ad targeting to retail forecasting to paleoclimatology. Along the way I have developed an enthusiasm for writing clean, modular and reusable software.

- Successful record as technical lead on projects focussing on inference and optimization.
- Broad knowledge of modern statistical modeling and machine learning theory and practice.
- Experience with distributed systems and map-reduce, primarily with Quantcast's proprietary Hadoop-like stack.
- Proficient with Java, Python (including NumPy, SciPy, Pandas and Jupyter), MATLAB and various flavours of SQL. Familiarity with C, C++, and Scala.

## EMPLOYMENT

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### Senior Modeling Scientist

2015 – present

*Quantcast, Brand Advertising*

- Lead data scientist responsible for modeling, real time bidding and control systems fundamental to advertising campaigns targeting specific audience segments. Primarily technical contributions, but with a growing role in project leadership and wider engineering strategy.
- Masterminded the design and implementation of a new framework to target and trade off between multiple customer performance goals, including derivation of optimal pricing equations, development of a new control system, and planning and coordination of software changes across the bidding stack, resulting in reliable and consistent performance and fewer unhappy customers.
- Wrote new libraries for real-time model scoring, vastly reducing code complexity and adding a new layer of abstraction, facilitating faster product development, cleaner code deployment, and reducing both computational load and developer pain.
- Upgraded the statistical methodology underlying the A/B test framework, introducing Bayesian inference and hypothesis testing, and providing a rigorous foundation for assessing hundreds of modeling experiments.
- Improved log parsing algorithms to extract double the volume of label data for flagship brand search product.
- Investigated numerous improvements to demographic modeling, including alternative multi-class classification models, methods for model calibration, and unsupervised approaches to discovering hidden classes.
- Won a company-wide hackathon for innovations in bid pricing strategies, and granted three trade secret awards.
- Mentored two summer interns and a winning intern hackathon team.

### Data Scientist and Modeling Consultant

2014 – 2015

*Tesco, Supply Chain Development*

- Developed custom statistical models and learning algorithms for probabilistic forecasting, and implemented them with MATLAB and SQL to run at scale on a Teradata data warehouse.
- Reduced annual waste by £12M.

### Postdoctoral Research Associate

2014 – 2015

*Cambridge University Engineering Department*

- Devised a number of new Markov chain Monte Carlo algorithms for machine learning with dynamical systems.
- Taught undergraduate engineers in MATLAB, signal processing, and mathematics.  
(Modules included linear algebra, probability, vector calculus, differential equations, and filter design.)

## EDUCATION

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University of Cambridge, Cambridge, UK

*PhD in Statistical Modeling and Algorithm Design*

2010 – 2014

- Thesis: “Particle filtering and smoothing algorithms for challenging time series models.”
- Formulated and applied statistical models and Bayesian algorithms for inference and learning.
- Worked on theoretical and applied projects, including development of new sequential Monte Carlo methods, and algorithm design for detection of heartbeats in cardiography data.

*BA & MEng in Information Engineering (1<sup>st</sup> with Distinction)*

2006 – 2010

- Highest mark in the class in 2008 and 2010; second highest in 2009. Equivalent of 4.0 GPA every year.
- Modules in signal processing, communications, control, hardware and software architecture, and electronics.

## RESEARCH

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- Main author on four journal and six conference papers on sequential and Markov chain Monte Carlo algorithms.
- Presented research at four international conferences, including oral and poster session.
- Co-author on two paleoclimatology papers, using Bayesian analysis with ice core data to infer the past state of the west Antarctic ice sheet.

## ACTIVITIES

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- Avid beach runner, wannabe cyclist, pianist and pine cone photographer
- Men’s Captain, Cambridge ’99s Rowing Club. Led team racing at Henley Royal Regatta. 2013 – 2014
- Captain, Cambridge University Sailing Team. Semi-finals of University Nationals. 2007 – 2008