Jim R. Skinner

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Profile

I am a PhD researcher in the Centre for Complexity Science at the University of Warwick. I am a data scientist within an interdisciplinary team working to diagnose disease from the “smell” of various biological samples (blood, urine, stool, etc) using an Electronic Nose. Disease prediction is data-driven: my role is to develop and apply novel machine learning methodology, and to produce high quality analyses and reports.

Education

2014–current | **PhD researcher, Centre for Complexity Science, Warwick University**
Thesis title: Getting the most from Electronic Nose data using Bayesian feature learning.
Summary: Produce analyses & Machine Learning algorithms for the Electronic Nose; a machine that may "smell" a patient’s blood/breath/urine and predict a disease diagnosis.

2013–2014 | **MSc in Complexity Science with Distinction, Warwick University**
Research project: Getting the most from molecular cancer data using unsupervised feature learning.
Research project: Design of RNA-based transcription switches to control living cells.

2009–2013 | **MEng in Computer Science with Artificial Intelligence, Southampton University**
First class with Honours. Prize awarded for outstanding group project.
Focus on Machine Learning, AI, Software Engineering & Bioinformatics.

Other research experience

2014 | **Research Assistant, Economics Department, University of Warwick, UK.**
Built tool in Python & regexp for extracting information from OCR-scanned historical records.

2012 | **Project Support Assistant, Electronics & Computer Science, Southampton University, UK.**
Javascript processing and integration of data obtained from a number of web APIs. Lead to the 2013 publication below.

Conference contributions

July 2017 | European Meeting of Statisticians, Helsinki, Finland.
Talk: *Structured PCA.*

Sep 2015 | Student Conference on Complexity Sciences, Granada, Spain.
Poster: *Sniffing out disease: data-driven smell-based diagnosis.*

Jun 2015 | International Symposium on Olfaction and Electronic Nose, Dijon, France.
Talk: *A rapid discrimination of diabetic patients from volunteers using urinary volatile and an Electronic Nose.*

Publications

2016 | *Breathomics–exhaled volatile organic compound analysis to detect hepatic encephalopathy: a pilot study.* Journal of Breath Research. (author 8 of 10)

2016 | *A simple breath test for tuberculosis using ion mobility: a pilot study.* Tuberculosis. (author 6 of 9)

2016 | *Non-invasive exhaled volatile organic biomarker analysis to detect inflammatory bowel disease (IBD).* Digestive and Liver Disease. (author 4 of 11)

Summer Schools & Study Groups attended

Sep 2016	Gaussian Processes Summer School. Sheffield, UK.
Mar 2015	European Study Group with Industry 107. Manchester, UK. Project: Segmentation and Scene Content in Moving Images

Local talks given

Nov 2016	Machine Learning Reading Group: **Structured PCA.**
Nov 2016	WMS Medical Statistics Book and Journal Club: **Probabilistic PCA and Beyond.**
Oct 2016	Machine Learning Reading Group: **PCA with prior knowledge.**
Jun 2016	Functional Data Analysis Reading Group: **Smooth PCA for Functional Feature Learning.**
Mar 2016	MathSys advisory board: **Electronic Noses and Statistical Modelling.**
Jan 2016	Young Researcher's Meeting: **Sparsity in Matrix Factorisations.**
Oct 2015	Warwick SIAM Student Conference: **Sniffing Out Disease.**

Teaching

2017 (current)	Tutor for Quantitative Analysis for Management I. Lead tutorial sessions introducing Business School students to statistics, probability and data visualisation.
2016	Teaching assistant for Statistics for Scientists course. Assisted teaching lab sessions in R covering Regression, Classification, Clustering & Hypothesis Testing.
2015	Teaching assistant for Introduction in Quantitative Skills for Bioscience. Assisted in lab sessions covering probability, ODE modelling and other quantitative skills in both R and MATLAB.

Skills

Machine Learning	AI & Machine Learning oriented Computer Science undergraduate degree. Current Machine Learning/Data Science oriented PhD. Machine Learning & Deep Learning reading groups.
Mathematics & Statistics	Routinely applied Probabilistic Modelling, Linear Algebra, Optimization & Bayesian Statistics throughout my studies.
Programming	3+ years experience: R, Python; 2 years experience: MATLAB, Java; 6 months experience: C, Javascript; some experience: C++, BASH, PERL, Lisp, PHP, machine code, SQL, regexp.
Software Engineering	Agile development, software engineering and group project experience (prize awarded) from taught undergraduate. Version control in Git (`https://github.com/JimSkinner`).
Communication	Many presentations given, including internationally, to specialist and general audiences. User of LaTeX and `knitr` R package to produce reports/communicate results.
Collaboration	Worked closely with Medics and Doctors from UHCW hospital. ISOEN 2015 presentation in Dijon resulting from collaboration with Engineer.

Professional activities

Reading Groups	Former organiser & current attendee of Machine Learning Reading Group (`www.warwick.ac.uk/mlrg`). Attendee of former Deep Learning & Functional Data Analysis reading groups.
Event organiser	On the organisation team for the 2017 Complexity Science Annual Retreat.

Interests

Sport Shooting	Former member of the Great Britain Junior Rifle Squad. Have competed internationally in England and Germany, and won bronze at the annual Bisley Junior International competition.
Sports	I enjoy bouldering, running, cycling and swimming.
Homebrew	I brew and mature my own beer, wine, cider and mead.