



Dr. Gareth Paul Jones, BSc (Hons), PhD

[Google Scholar](#) | [GitHub](#) | [Kaggle](#) | [LinkedIn](#) | [Projects & self-study](#)

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Education

2012: Doctor of Philosophy, Neuroscience, University of Sussex, UK.

2007: Neuroscience BSc, Hons, University of Sussex, UK.

2012-Present: [Multiple self-study](#) Open University, Coursera and edX courses mainly focusing on machine learning, data science, programming, statistics.

Awards

2017: Ranked 171/60,592 on [Kaggle.com](#)

2017: Bronze medals in Kaggle Data Science Bowl ([Code](#)) and NOAA Fisheries Steller Sea Lion Population Count ([Code](#))

2016: 3rd Place (top solo entry) EEG Seizure Prediction competition ([Code](#))

2016: 17th Place Integer Sequence Learning competition ([Code](#))

Professional experience

2013-Present: University College London, UK - Research associate

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| Research: | <ul style="list-style-type: none">Investigating the neural mechanisms of multisensory (auditory and visual) processing and perceptual decision making, using multi-channel electrophysiology, psychophysics, and computational modelling. |
| Responsibilities: | <ul style="list-style-type: none">Experimental software design, implementation, and analysis of psychophysical tasks for animals and humans (MATLAB, Python).Large scale electrophysiological and psychophysical data collection.Handling, cleaning, and analysis of multi-terabyte data sets.Supervision and teaching of Masters and PhD students.Implementation of GIT for code management with multiple users. |

2011-2013: University of Brighton, UK - Research fellow

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| Research: | <ul style="list-style-type: none">Mechanical analysis of the mammalian tectorial membrane, using laser interferometry and computational modelling.Experimental design for <i>in vivo</i> optogenetics and laser interferometry paradigms. |
| Responsibilities: | <ul style="list-style-type: none">Software design for data collection and analysis (MATLAB).Modernisation of existing experimental software and hardware interfaces.Supervision and teaching of PhD students. |

2007-2011: University of Sussex, UK - PhD Student and Associate tutor

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| Research: | <ul style="list-style-type: none">Low-level multisensory integration (auditory and vestibular).Mechanical analysis of the mammalian tectorial membrane. |
| Responsibilities: | <ul style="list-style-type: none">Automating data analysis for multiple projects (MATLAB).Teaching undergraduate neuroscience and electrophysiology. |

Recent publications, conference papers, and talks

Crowdsourced epileptic seizure prediction with big data, L Kuhlmann, *et. al.* Submitted to lancet, July 2017.

Using Machine Learning to Predict Epileptic Seizures, GP Jones. [Mathworks.com blog](#), in press.

Seizure Prediction Competition, 3rd Place Winner's Interview, GP Jones. [No Free Hunch, Kaggle.com, 2017](#).

Acute Inactivation of Primary Auditory Cortex Causes a Sound Localisation Deficit in Ferrets, KC Wood, SM Town, H Atilgan, GP Jones, JK Bizley. PloS one 12 (1), 2017.

Integration of visual information in auditory cortex promotes auditory scene analysis through multisensory binding, H Atilgan, S Town, K Wood, G Jones, R Maddox, A Lee, JK Bizley, BioRxiv (in review), 2017

Integer Sequence Learning solutions post, GP Jones and L Borderie. [No Free Hunch, Kaggle.com 2016](#).

Where are multisensory signals combined for perceptual decision-making? JK Bizley, GP Jones, SM Town. Current Opinion in Neurobiology 40, 31-37, 2016.

Exploring the role of synchrony in auditory-visual integration in ferrets and humans, GP Jones. Invited talk, MRC Institute of Hearing Research, Nottingham, UK, 2016.

Technical skills

Machine learning and statistics

Descriptive and inferential statistics (ANOVA, post-hoc tests, etc.); Bayesian probability; multiple Kaggle competition entries; feature extraction and engineering; model fitting and cross validation in MATLAB, R (Caret, XGBoost), Python (Pandas, Scikit-Learn, Numpy, XGBoost, LightGBM, Matplotlib, Seaborn); linear and logistic regression, ARIMA time series models; non-parametric modelling including forest ensembles, neural networks, SVMs (MATLAB, Scikit-Learn, XGBoost); deep learning for sound and image recognition (TensorFlow, Keras).

Programming

Expert in MATLAB and Python, proficient in R; multi-threading; object orientation; memory management; debugging; profiling; thorough understanding of hardware requirements, limitations, bottlenecks etc.; Windows and Linux environments; code management using GIT.

Data analysis

Curiosity; data management; cleaning, and analysis of a diverse range of large and small data sets; signal analysis; dimensionality reduction; processing and analysis of multi-channel, noisy electrophysiological data; curve fitting; signal detection theory and psychometric models.

Modelling

Bayesian perception; regression models; time-series models; drift diffusion evidence accumulation and auto-regressive time-series models; biophysical mechanical modelling; psychometric and neurometric decision making; multisensory integration and object formation; Markov chains; financial modelling and econometrics including portfolio theory, constant expected return models.

Experimental design

Specification, design, and deployment of multi-user, high-demand experimental hardware and software for multiple projects, including physiological, electrophysiological, and psychophysical data collection; app design for non-expert users; bespoke data management systems.

Communication

Academic publication; conference poster presentation; oral presentation; tutoring (GCSE, A-level and undergraduate levels); lecturing and practical demonstration (under and post graduate level); data visualisation; light microscopy photography; invited blog contributions for Kaggle and Mathworks.