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 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

Research:
- Investigating the neural mechanisms of multisensory (auditory and visual) processing and perceptual decision making, using multi-channel electrophysiology, psychophysics, and computational modelling.

Responsibilities:
- 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

Research:
- Mechanical analysis of the mammalian tectorial membrane, using laser interferometry and computational modelling.
- Experimental design for *in vivo* optogenetics and laser interferometry paradigms.

Responsibilities:
- 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

Research:
- Low-level multisensory integration (auditory and vestibular).
- Mechanical analysis of the mammalian tectorial membrane.

Responsibilities:
- Automating data analysis for multiple projects (MATLAB).
- Teaching undergraduate neuroscience and electrophysiology.

Recent publications, conference papers, and talks

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.

Recent publications, conference papers, and talks (cont.)

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.

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

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); 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).

Personal and computational finance

Financial modelling and econometrics; portfolio theory; CERM models; time-series, auto-regressive models; cryptocurrencies (Bitcoin, Ethereum, various Scrypt coins, etc.)

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.

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; biophysical mechanical modelling; psychometric and neurometric decision making; multisensory integration and object formation; Markov chains.

Statistics

Descriptive and inferential statistics (ANOVA, post-hoc tests, etc.); Bayesian probability.

Experimental design

Specification, design, and deployment of high-demand experimental hardware and software for multiple projects, including physiological, electrophysiological, and psychophysical data collection.

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.