Michael Longley

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Background and Objectives

A neuroscientist with a decade of experience working in world-class research institutions. I have expertise in a broad range of analytical approaches, data-processing and analysis and several years' experience using data-science packages including Python, MATLAB and R. I want to apply my knowledge and passion for working with data to new challenges beyond academia.

Technical Skills

Programming Languages: 2+ years Python | Bash | R ***1 year*** SQL ***5+ years*** MATLAB
Data Handling/ Visualisation: 5+ years MATLAB | SPSS | Excel ***2+ years*** Pandas | Numpy | SciPy | Matplotlib | Jupyter | R Markdown ***1 year*** PostgreSQL | PowerBI
Data-Processing pipelines: 5+ years fMRI (brain imaging) analysis pipelines (MATLAB, SPM, FSL) | MATLAB & Bash pipelines **|** Electrophysiology analysis pipelines (MATLAB)
Data Analysis: 5+ years Timeseries analysis | Statistical Regression | Other Inferential Statistics (GLM, ANOVA, t-test etc) | Statistical Parametric Mapping

Transferable Skills

Project Management:

- Responsible for the planning and realization of a number of research programmes. In my most recent position this involved:
  Working with external companies and institutions to build equipment and design behavioural experiments to run simultaneously with brain-imaging; Working with University Ethics committees; Managing the work of research assistants and PhD students; Coordinating bookings for oversubscribed brain-imaging facilities and the timetables of research participants to ensure timely completion of data-collection.
- I have used GANTT-Charts extensively to balance competing time-demands in my role as a researcher: running experiments, analysing data, writing for publication and departmental demands (teaching, presenting at seminars and committee meetings).

Communication & Presentation:

- Gave regular updates on project progress in weekly lab-meetings.
- Shared updates on newly collected data and on-going projects in small departmental seminars
- Presented work as talks and poster presentations at local and international conferences (SfN, FENS and BNA, CUBIC fMRI facility user-group)
- Presented to non-expert audiences: public science communication events, school outreach and seminars and lectures at undergraduate and MSc level.

Problem-solving Skills:

- Built equipment and wrote custom code for the collection of behavioural data (and its analysis) with a MRI-compatible high-speed, high resolution camera.
- Worked alongside the RHUL engineering department to: design and fabricate an optoelectronic device to measure eye-lid movements in the confines of an MRI scanner.

Research and analysis highlights

Studied the aging-related changes in network connectivity of brain regions (frontal cortex and cerebellum) from an existing fMRI dataset of ~600 participants. I used MATLAB and Bash on a Linux cluster to cleanse, pre-process and analyse 100s GB of raw fMRI data giving me experience working with secondary data, handling very large data-sets and parallelizing processes using cluster computing. Studied brain activity in participants whilst they performed learning and memory tasks. The analysis of 4-D datasets from event-related fMRI data has given me experience applying regression analysis and statistical parametric mapping.

Work Experience

Postdoctoral Research Scientist (May 2019 – February 2022) *Royal Holloway, University of London.*

- Used fMRI and behavioural testing to study the role of cerebellar and frontal cortical activation in human learning and memory. Combined fMRI to measure brain activity with use of high-speed cameras and EMG to measure behavioural responses - Scripted all experiments and data analysis in MATLAB. Regression analysis and other inferential statistics to understand relationships between behaviours and brain activity.
- Analysed pre-existing aging data-sets to study age-related changes in network connectivity in the brain – Handling of large data-sets, cluster computing, coding for complex data visualisation using MATLAB.
- Lab supervision of Masters and Undergraduate Psychology students.
- Teaching of Undergraduate students in Psychology department.

Assistant Researcher (April 2016 – April 2019) *Lund University.*

- Examining the role of monoamines in cerebellar-dependant motor learning using behavioural techniques, *in-vivo* extracellular electrophysiology and pharmacological injections - Inferential statistics of behaviour and scripted analysis of response topography, time series analysis of electrophysiological recordings in MATLAB and R.
- A collaborative effort with a clinician at Skånes university hospital to survey the monoaminergic fibres in the rat and ferret brain.

PhD researcher (Sept. 2011 – March 2016) *University College London (UCL)*

- Studying the involvement of monoaminergic signalling in motor learning with animal behavioural techniques and psychopharmacology - Inferential statistics and analysis of response topography using MATLAB and SPSS.
- A study of monoaminergic protein expression in the cerebellum using immunohistochemistry and multi-photon microscopy - Image analysis using ImageJ
- Lab supervision of Masters and Undergraduate Neuroscience students
- Teaching of Undergraduate students in life-science and medical faculties

Part-time research assistant (Intern) (Sept. 2009 – Aug. 2010) *Institute of Psychiatry. Kings College University*
Assisted full-time research staff and PhD students with day-to-day research tasks, using human neuroimaging to study psychosis and antecedents of schizophrenia. Specific tasks included: Literature searches, Meta-analyses of fMRI data, Image analysis of structural MRI data.

Education

PhD Behavioural Neuroscience. Oct. 2011 – Mar. 2016. University College London, University of London
MSc Neuroscience. Oct. 2010 – Sept. 2011. *Award: Distinction.* University College London, University of London
BSc Psychology. Oct. 2006 – Sept. 2009. *Award: 1st Class Honours.* Royal Holloway, University of London