

# Linden Parkes, Ph.D.

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## EDUCATION

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- **Monash University** Melbourne, Australia  
*Doctor of Philosophy (Neuroscience, Psychology, Psychiatry)* 2014 – June 2019
  - **Swinburne University of Technology** Melbourne, Australia  
*Bachelor of Science (Psychology, Psychophysiology)* 2009 – 2013  
*Honours (capstone research project), First Class, Dux (top of the class)*
- Relevant Coursework:** Statistics, Design & Research Methods, Technology & Data Acquisition, Advanced Quantitative Methods

## EXPERIENCE

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- **The University of Pennsylvania** Philadelphia, PA  
*Postdoctoral Research Fellow* March 2019 - Present
  - **Predictive Modeling:** Performed anomaly detection in normative models of brain development
- **The University of Pennsylvania** Philadelphia, PA  
*Teaching Assistant* Fall 2019
  - **Guest Lecturer:** Preparation and delivery of teaching material for a class on Network Neuroscience
- **Donders Institute for Brain, Cognition and Behaviour** Nijmegen, The Netherlands  
*Visiting Research Fellow* Sept. 2018 - Oct. 2018
  - **Predictive Modeling:** Contributed to development of Python library used by institute and collaborators
- **Torus Games** Melbourne, Australia  
*Research Fellow* March 2016 - Oct. 2017
  - **Consulting:** Communicated research goals to software developers at Torus games and ensured all stakeholders interests were represented
  - **Firebase:** Built workflows for ingest and storage of data in Firebase. Wrote code to download and process data used by other scientists. Code available upon request

## SCIENTIFIC PROJECTS

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- **Predictive modeling project in brain development throughout childhood and adolescence:** Successfully detected developmental brain abnormalities associated with psychiatric disorders. Delivered improved biomarker detection methods for mental health. All **Python** code written in **Jupyter notebooks** publicly available on [Github](#)
- **Machine learning on the intersection of human brain imaging and genetics:** Successfully uncovered genetic signatures of subregions of the subcortex defined according to connectivity profiles. Provided novel framework for how to bring together different neuroimaging datasets through machine learning. Paper ranked in the **top 20 downloaded** from the journal in 2017
- **Processing and quality control of brain imaging data:** Designed and built pipelines for processing large brain imaging datasets via **high-performance computing**, including generating quality control reports. Implemented pipelines on multiple open-access datasets used for subsequent projects by myself and other scientists and provided concrete recommendations for the field. Paper ranked by the journal in the **top 20 downloaded** and in the **top 0.01% most cited** publications in 2018 in the field of Neuroscience. All code publicly available on [Github](#)
- **Causal models of brain circuits in psychiatric disorders:** Used generative models of brain dynamics to assess dysfunction in brain circuits in psychiatry. Successfully uncovered direction of dysfunctional information flow in brain circuits and provided evidence for brain stimulation targets in patient groups. Paper published in leading **peer-reviewed journal**. All code publicly available on [Github](#)

## SKILLS

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- **Machine Learning:** Classification (Decision Trees, SVC), Unsupervised Clustering, Regression (Linear, GPR, GAM, Regularization), Cross-validation, Model Scoring, Parameter Tuning, Feature Selection & Standardization, Dimensionality Reduction
- **Statistics:** Experimental Design, Null Hypothesis Testing, Analysis of Variance, Data Resampling (permutation, bootstrapping), Dependent Data (e.g., repeated measures), Bayesian Inference, Time Series Analysis, Network Science
- **Coding:** Python (Pandas, NumPy, SciPy, Scikit-Learn, [Pingouin](#), Statsmodels, Matplotlib, Seaborn, [pyGAM](#)), Matlab, Shell, Git, Linux OS, LaTeX; Familiar with: SQL

Full details of publications, presentations, committee service, outreach, and mentorship available upon request.