Rex Parsons

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Education

Queensland University of Technology (QUT) **2020–Present**
Biostatistics PhD **(Anticipated completion: late 2023)**
Thesis: High dimensional data for predicting inpatient falls.
Supervisors: Dr Susanna Cramb, Prof Steven McPhail and Dr Ahmad Abdel-hafez

University of Newcastle **2019–2020**
Medical Statistics MMedStat 6.88/7 GPA

University of Queensland **2015–2017**
Biomedical Science BSc and Honours (Neuroscience)
Thesis: The Role of Melatonin on Hippocampal Rhythmicity.
Supervisors: Dr Oliver Rawashdeh and Dr Prasad Chunduri.

Employment

Senior Research Assistant **Nov 2020–Present**
QUT (Centre for Data Science and Australian Centre for Health Services Innovation) *Brisbane, Australia*
Several roles on continual basis for a range of projects where I mostly performed statistical analyses.
For each appointment, supervisor's name and brief description of work:

- Nicole White; (1) Risk factors associated with COVID-19 with the COVID Critical Research Group.
- Nicole White; (2) Interrupted time series analysis and risk model implementation projects at large hospital network.
- Nicole White; (3) Meta-research on registered clinical prediction model studies.
- Gentry White; Development of (DSSP), an R package for fitting Bayesian spatial models by direct sampling.
- Susanna Cramb; Spatial data analysis and visualisations of access to care with R, presented as a shiny app.
- Sanjeewa Kularatna; Health economic evaluation of policy change by the Department of Veteran Affairs.

Research & Development Scientist **Mar 2020–Aug 2020**
Ellume *Brisbane, Australia*

- Immunoassay and algorithm development for SARS-CoV-2 Serology rapid diagnostic test.
- Redesigned the algorithm development workflow which improved generalisability and significantly reduced the time required to optimise.
- Algorithm developed was used for FDA application for serological diagnostic and was the best performing diagnostic test approved by FDA at the time of approval.

Healthcare Data Analyst **Jun 2019–Mar 2020**
City Fertility *Brisbane, Australia*

- Dashboard development using shiny and direct odbc for up-to-date analytics on KPIs.
- Streamlining monthly reporting processes for marketing and services given using R.
- Data acquisition, cleaning and statistical analysis for clinician-led research projects.
- Clinical prediction model development for In-Vitro-Fertilisation treatment success.

Project Coordinator **Mar 2018–Jun 2019**
UnitingCare Medical Imaging *Brisbane, Australia*

- Occupational lung disease and radiology research.
- Questionnaire development with Qualtrics.
- Data analysis and visualisations.
- Grant applications and project reports to project funders.

Research Assistant **Jan 2016–Mar 2018**
Ellume *Brisbane, Australia*

- Immunoassay development for influenza virus and Group A streptococcus rapid diagnostic test.
- Worked in a multidisciplinary team to rapidly iterate and develop medical diagnostic devices.

Technical Skills

Proficient: R, Shiny, Data Analysis and Visualisation, Statistical Modelling, Functional Programming
Competent: Python, SQL, Machine Learning, Git & GitHub, Object-Oriented Programming

Statistical Software Development

`predictNMB` **CRAN and rOpenSci March 2023**

- An R package that allows the user to perform Monte Carlo simulations to estimate the cost-effectiveness of using a prediction model to assign a healthcare intervention.
- Can be used to determine whether or when a clinical prediction model or clinical decision support system may be worthwhile before development or implementation.

`DSSP` **CRAN June 2022**

- An R package that allows users to fit Bayesian spatial models with direct sampling (*fast*).
- Draws samples from the direct sampling spatial prior model which is 100-1000 times faster than MCMC.

`simMetric` **CRAN January 2022**

- An R package that provides functions to calculate useful metrics (and their Monte Carlo standard errors) for the assessment of statistical methods in simulation studies.
- This allows for easy integration with other simulation study frameworks and the tidyverse-style workflow.

`circacompare` **CRAN February 2021**

- An R package that allows users to analyse circadian datasets using nonlinear regression models.
- Documented with a vignette; also available as a shiny app and in python.

Teaching

Queensland University of Technology **Brisbane, Australia**

- MXN500: Statistical Data Analysis (Sessional Tutor) Semester 1, 2021
- SEB113: Quantitative Methods in Science (Sessional Tutor) Semester 2, 2021
- PUN108: Clinical Informatics for Intelligent Healthcare (Guest Lecturer) Semester 2, 2021
- PUB358: Digital Health Perspectives (Guest Lecturer) Semester 1, 2023

Selected Papers

1. *RD Blythe,* **Parsons R,** *Barnett AG, SM McPhail, NM White* **J Clin Epi (2023)**
   Vital signs-based deterioration prediction model assumptions can lead to losses in prediction performance.
2. **Parsons R,** *RD Blythe, Barnett AG, SM Cramb, SM McPhail* **JOSS (2023)**
   predictNMB: An R package to estimate if or when a clinical prediction model is worthwhile.
3. **Parsons R,** *RD Blythe, SM Cramb, SM McPhail* **JAMIA (2023)**
   Integrating economic considerations into cutpoint selection may help align clinical decision support towards value-based healthcare.
4. **R Parsons**, *RD Blythe, SM Cramb, SM McPhail* **Gerontology (2022)**
   Inpatient Fall Prediction Models: A Scoping Review.
5. *R Blythe,* **Parsons R,** *NM White, D Cook, SM McPhail* **BMJ Qual Saf (2022)**
   A scoping review of real-time automated clinical deterioration alerts and evidence of impacts on hospitalised patient outcomes.
6. **R Parsons**, *R Parsons, N Garner, H Oster, O Rawashdeh* **Bioinformatics (2020)**
   CircaCompare: a method to estimate and statistically support differences in mesor, amplitude and phase, between circadian rhythms.

Funding and Awards

1. Venables Award runner-up for predictNMB R package development. **(2023)**
2. Student travel prize winner at the International Conference on Health Policy Statistics. **(2023)**
3. SuperHERO award winner for outstanding engagement/collaboration. **(2021)**
4. Queensland AI Hub Medical Datathon winning team. **(2020)**
5. Digital Health CRC Industry Scholarship Recipient: $45,000 p.a. for four years during PhD studies. **(2020)**