GRANVILLE MATHESON

I am an academic data scientist with a background in neuroscience. I am a generalist, but my speciality is in statistical modelling and inference, as well as presentation and communication. My work has made international news and been cited in policy[1], I have been involved in developing field-wide guidelines for study reporting to improve replicability[2] and software that I developed for pharmacokinetic modelling[3] is currently in use in numerous institutions across the world. I am passionate about learning new things, and enjoy the challenge of presenting complex results in a compelling way to audiences with different backgrounds.

I am currently looking for a position that allows me to work with complex data to derive useful insights, and to develop tools to streamline the process and make it reproducible.

EDUCATION

2018 | 2014

PhD, Medical Science

Stockholm, Sweden — Karolinska Institutet

- Thesis: Reliability, Replicability and Reproducibility in PET Imaging
- Working with PET imaging of the dopamine system in psychosis and proneness to developing psychosis, as well as methods development.

2013 | 2010

MSc, Cognitive Neuroscience

Utrecht, The Netherlands — Universiteit Utrecht

- Cognitive Neuroscience Track

2009

BA Hons, Psychology

Johannesburg, South Africa — University of Witwatersrand

- Thesis: Investigating the Nature of the Recruitment of the Inferior Frontal Gyrus in Musical Syntax Processing

2008 | 2006

BSc, Psychology, Applied Chemistry

Johannesburg, South Africa — University of Witwatersrand

- Other courses: Chemistry I & II, Major Physics I, Major Pure Mathematics I, Research Design and Analysis

RESEARCH EXPERIENCE

2022 | 2020

Postdoctoral Researcher*

Columbia University — Molecular Imaging / Biostatistics

- * Cancelled / indefinitely postponed on account of COVID-19 pandemic (NYC)
- Developing Bayesian methods for performing pharmacokinetic modelling using a multilevel framework, with Markov Chain Monte Carlo.

CONTACT

mathesong@gmail.com
granvillemath
github.com/mathesong
granvillematheson.com
linkedin.com/in/granville-matheson-38372b26/

LANGUAGE SKILLS

- R
- MATLAB
- Python
- Bash

Made with the R package pagedown.

Last updated on 2020-04-07.

2020 | 2018

Postdoctoral Researcher

Karolinska Institutet — Cervenka Lab, PET Group

- Developing tools for reproducible modelling, data storage and documentation.

2014 | 2012

Research Assistant

Karolinska Institutet — Cervenka Lab, PET Group

- Respondible for image processing and analysis of MR and PET Imaging data for the Karolinska Behavioural PET Database

2011 | 2010

Research Intern

Universiteit Utrecht — Ramakers Group, Rudolf Magnus Institute

- Worked with single-cell electrophysiology to investigate the dynamics of ion channel caused by morphine

TEACHING EXPERIENCE

2019 | 2015

Positron emission tomography imaging of the CNS

Karolinska Institutet — Stockholm, Sweden

- Lecturer and TA training students in biannual course, teaching about pharmacokinetic modelling and statistical analysis

2009

Research Design and Analysis

University of Witwatersrand — Johannesburg, South Africa

- Tutor for research design and statistics

I am passionate about teaching, and in addition to direct teaching experience, I have held numerous seminars to teach colleagues how to approach statistical problems, and to share knowledge about various new tools that may be helpful.

SELECTED DATA SCIENCE WRITING

2020

Nonlinear Modelling using nls, nlme and brms

granvillematheson.com

- A demonstration of how to fit nonlinear models using standard gradient descent optimisation, as well as both frequentist and Bayesian multilel modelling strategies

2020

Creating an API for 4.2M texts with tidytext, RSQLite, dbplyr and plumber

granvillematheson.com

- I prototyped an idea for identification of useful patterns in a large set of text data, to identify useful skills to learn to maximally improve employability from job postings.
- To handle the data set size, I turned it into a SQLite database for fast, convenient access, and then created an online API to make its results accessible.

I have a blog about data science and visualisation where I publish mostly side projects. Upcoming posts include city commute time visualisations.

2020 **Pharmacokinetic Modelling of PET Data in R using kinfitr. Part 2: Basics and Iteration**[4]

granvillematheson.com

- Part 2 of a four part series describing my kinetic modelling R package. Here I cover basic usage of the package. I cover bias-variance tradeoffs and other relevant considerations during modelling.

2018 **My Physiological Response to my PhD Defence**[5]

granvillematheson.com

- I recorded my physiological data in the months leading up to my PhD defence, and analysed it here, using data visualisation to tell the story of my sleep changes, and heart rate, both before and during the defence.
- I also wrote an R package for extracting this data from the Withings API. I have been contacted by others from around the world who are using my software.

2018 **Making a Reminder Bot for Automating Meeting Organisation using R and Google Sheets**[6]

granvillematheson.com

- Demonstrated my reminderbot system which has effectively automated the organisation for two sets of meetings continuously for the past 4 years.
- Setting up a productionised system, running several times each week on a Raspberry Pi

2018 **The Weather in Stockholm, Inside and Out, and the Curious Case of Summer 2018**[7]

granvillematheson.com

- Analyzing meteorological data from open data and private data, examining the effects of global warming, and examining how extreme 2018 really was

SELECTED PRESS

2020 **Brain PET research at critical 'crossroads' – must move toward collaboration to advance**[8]

- Our paper imploring the field make greater use of collaborative research and data sharing, and sharing lessons learned in our experiences, received some press attention.

2017 **It's not just you: science papers are getting harder to read**[9]

- Our readability article, for which I was shared first author, was covered in international news, both mainstream and scientific, and even cited in UK policy documents

SELECTED PUBLICATIONS

2020

Guidelines for the content and format of PET brain data in publications and archives: A consensus paper

Journal of Cerebral Blood Flow & Metabolism

- Authored with all the influential figures in our field
- This article establishes a consensus for how to report on studies within our field, for which I was asked to contribute my expertise.

2020

Kinfitr – an open source tool for reproducible PET modelling: validation and evaluation of test-retest reliability

bioRxiv

- Authored with Jonathan Tjerkaski, Simon Cervenka and Lars Farde
- I supervised this project, in which we evaluated the performance of my kinetic modelling R package against the established commercial tool used in our field.

2017

The readability of scientific texts is decreasing over time

Elife

- Authored with Pontus PlavÃ©n-Sigray, BjÃ¶rn Schiffler and William Hedley Thompson
- This project resulted from our gathering as PhD students, without any supervisors, for a collaborative data science project. In this, we learnt version control with GitHub, collaborative coding among other things.

2015 | 2019

We need to talk about reliability: making better use of test-retest studies for study design and interpretation

PeerJ

- Sole author publication
- I present a new statistical method for estimating study feasibility with limited, and not directly representative data.

AWARDS

2019

Psykiatrifonden Award

Stockholm, Sweden — Psykiatrifonden

2019

Janssen Fellowship in Translational Neuroscience

New York, USA — Janssen Foundation

2018

Karolinska Travel Grant

Stockholm, Sweden — Karolinska Institutet

2016

Young Investigator Award

Boston, USA — NeuroReceptor Mapping Conference

2015

ISCBFM Young Investigator Travel Bursary

Vancouver, Canada — Brain & BrainPET Conference

2009

Psychology Honours Award

Johannesburg, South Africa — University of Witwatersrand

2009

Postgraduate Merit Scholarship

Johannesburg, South Africa — University of Witwatersrand

2008 **McGraw-Hill Award**
Johannesburg, South Africa
University of Witwatersrand

2008 **Merck Gold Medal for Interdisciplinary Excellence**
Johannesburg, South Africa
University of Witwatersrand

LINKS

1: https://www.altmetric.com/details/18028335
2: https://journals.sagepub.com/doi/abs/10.1177/0271678X20905433
3: https://github.com/mathesong/kinfitr
4: https://www.granvillematheson.com/post/pharmacokinetic-modelling-of-pet-data-in-r-using-kinfitr-part-2-basics-and-iteration/
5: https://www.granvillematheson.com/post/self-portrait/
6: https://www.granvillematheson.com/post/reminder-bot/
7: https://www.granvillematheson.com/post/20180821-stockholmweather/
8: https://www.healthimaging.com/topics/molecular-imaging/brain-pet-crossroads-collaboration-advance
9: https://www.nature.com/news/it-s-not-just-you-science-papers-are-getting-harder-to-read-1.21751