





GRANVILLE MATHESON

I am an academic data scientist with a background in neuroscience. I am a generalist, but my primary strengths are in statistical modelling and inference, as well as presentation and communication. My work has made international news and been cited in policy¹, I have been involved in developing field-wide guidelines for study reporting to improve replicability² and software that I developed for pharmacokinetic modelling³ 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**
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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**
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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**
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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**
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2020
Postdoctoral Researcher*
Columbia University  Molecular Imaging / Biostatistics
 - * Cancelled / postponed as a result of COVID-19 pandemic
 - Developing Bayesian methods for performing pharmacokinetic modelling using a multilevel framework, with Markov Chain Monte Carlo.

CONTACT

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 [granvillemath](https://twitter.com/granvillemath)
 github.com/matheson
 granvillematheson.com
 linkedin.com/in/granville-matheson-38372b26/

LANGUAGE SKILLS

R	
MATLAB	
Python	
Bash	

Made with the R package
[pagedown](https://github.com/jgm/pagedown).

Last updated on 2020-04-05.

- 2020
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2018

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Postdoctoral Researcher
 Karolinska Institutet

📍 Cervenka Lab, PET Group

- Finishing up remaining projects, training others in image analysis and kinetic modelling tools, and developing tools for reproducibility and documentation.
- 2014
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2013

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Research Assistant
 Karolinska Institutet

📍 Cervenka Lab, PET Group

- Working on analysing the Karolinska Database to examine seasonal and diurnal effects of protein expression
- 2012

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Research Intern
 Karolinska Institutet

📍 Cervenka Lab, PET Group

- Responsible for image processing and analysis of PET imaging data for the Karolinska Behavioural PET Database
- 2011
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2010

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Research Intern
 Universiteit Utrecht

📍 Ramakers Group, Rudolf Magnus Institute

- Worked with single-cell electrophysiology to investigate the dynamics of ion channel caused by morphine
- 2010

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Research Assistant
 University of Witwatersrand

📍 Department of Psychology

- Assisted in a literature search for the neuroscientific bases for trichotillomania



TEACHING EXPERIENCE

- 2019
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2015

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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

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Research Design and Analysis
 University of Witwatersrand

📍 Johannesburg, South Africa

- Tutor for research design and statistics



SELECTED DATA SCIENCE WRITING

- 2020

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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 multilevel modelling strategies

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.

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

- 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.
- 2020 ● **Pharmacokinetic Modelling of PET Data in R using kinfitr. Part 2: Basics and Iteration⁴**
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 Defence⁵**
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 Sheets⁶**
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 2018⁷**
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 advance⁸**
- 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 read⁹**

- 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 Plavén-Sigray, Björn 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
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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 ● **Psykiastrifonden Award**

Stockholm, Sweden

📍 Psykiastrifonden

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/matheson/kinftr>
- 4: <https://www.granvillematheson.com/post/pharmacokinetic-modelling-of-pet-data-in-r-using-kinftr-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>