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<https://github.com/mxochicale/riots-sth-20200225>

Fully Open Access PhD Thesis

RIOTS Club @ St Thomas

25th February 2020 for 1200
at Maisey Seminar Room

Miguel Xochicale, PhD

School of Biomedical Engineering and Imaging Sciences
King's College London

Outline

1. My journey into Open-Access (OA) science
2. Who to follow?
3. What tools I use?
4. How to do an OA thesis?
5. Takeaways

INTRODUCTION

My journey as ...

... open-source enthusiast and open-access scientist

- **(2004-2006)** MSc in Signal Processing
Arduino is an open-source hardware and software company
- **(2013-2014)** Research Assistant in Robotics at INAOE
Discovered R and github [github.com/jwf-zz/tdetools]
- **(2014-2019)** PhD student in Robotics at Uni of Bham
Open-access scientist [twitter.com/o_guest]
and open-source enthusiast [github.com/severin-lemaignan]
- **(2019-present)** Research Associate in Ultrasound-Guidance Intervention at KCL
Continuously-integrated Open-source Reproducible TeX
[github.com/rodluger/corTeX]

PEOPLE

Olivia Guest (pro-#openscience)

Olivia Guest | Ολιβία Γκεστ
@o_guest

goth • computational cognitive modeling • geek & techish Cypriot • queer • she/they
• pro-#openscience • anti-#bropscience • neuroplausible.com

⌚ Cyprus ⌚ oliviaguest.com 📅 Joined October 2015

4,734 Following 7,149 Followers

neuroplausible

About

I Hate Matlab: How an IDE, a Language, and a Mentality Harm

Olivia Guest March 17, 2017 77 Comments

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I dislike Matlab not only because it's closed source and not free software, but primarily because limiting education to just Matlab goes on to limit students' and scientists' skills.

Closed Source Means Closed Science

Secondly, Matlab is closed source, proprietary, and prohibitively expensive if you have to buy it yourself. They obfuscate their source code in many cases, meaning bugs are much harder to spot and impossible to edit ourselves without risking court action. Moreover, using Matlab for science results in paywalling our code. We are by definition making our computational science closed.

Many people in the mutually inclusive open science and open software movements hope to see Matlab surpassed sooner rather than later and some even think it is inevitable. By extension, people in these movements tend to think freely deciding to use Matlab (and indeed any closed source software) in science is at least questionable and at most unethical. I believe in free and open software and science, so I am in principle opposed to Matlab's grip on science.

The principles of open science, by Andreas E. Neuhof

https://twitter.com/o_guest

ReScience organization

Reproducible Science is good. Replicated Science is better.

Bordeaux <https://rescience.github.io>

Repositories 11 Packages People 25 Projects

rescience.github.io
ReScience website repository

ReScience
The ReScience project. Reproducible Science is great. Replicated Science is better.

Rescience-submission
ReScience submission repository

Top languages

People

https://github.com/oliviaguest

Severin Lemaignan (Open-source Enthusiast)



Séverin Lemaignan

@skadge

Social robots tamer & #AssociateProf in #SocialRobotics and AI @BristolRobotLab

🔗 academia.skadge.org Joined April 2009

105 Following 262 Followers

GAZR

It performs 3D head pose estimation and pixel tracking.

[GET THE DATASET](#)

PINSORO

This dataset was recorded while freely playing with a peer or a robot. It contains 10 hours of raw video recorded with a Kinect sensor.

[HOME PAGE](#) [THE DATASET IS ZEROED](#)

RELATED PUBLICATIONS

[From Real-Time Gaze Estimation to 3D Head Pose](#)

<https://twitter.com/skadge>

severin-lemaignan / ros-presentation

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Introduction to ROS - day-long workshop

A day-long introduction to the Robotic Operating System.

Introduction to ROS - day-long workshop

Several of the hands-on activities rely on the [https://github.com/severin-lemaignan/ros-tutorials](#) repository.

[Download the slides](#)

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<https://github.com/severin-lemaignan>

Who to follow? What to read and to heard?

Open Science Advocates



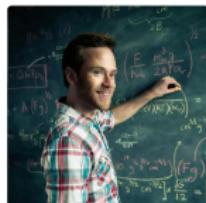
Dr. Rachael Ainsworth
Science Communicator
@RachaelAinsworth
Community Manager & #OpenScience advocate @OfficialASW
| PhD in Radio Astrophysics | Open Data Advocate | Organiser @ TDx Speaker | Sheperd
Manchester, England | [rachaelainsworth.tdx.ac.uk](#) | Joined April 2010
1,094 Following | 1,167 Followers



Ulrich Dirnagl
@dirnagl
enriching.org 0090 9003-0700...
Berlin, Germany | [dirnagl.com](#) | Joined December 2009
96 Following | 1,309 Followers



Corin Logan
@corinlogan
Das gibt es nicht, because they're brilliant in their field and have great research! [corin.chat](#), Leipzig, Faculty of Mathematics and Physics
Leipzig, Germany | [CorinLogan.com](#) | Joined September 2012
1,315 Following | 1,819 Followers



Rodrigo Luger
[rodluger](#)

Astronomer at the Center for Computational Astrophysics

@Flatiron Institute

New York, NY

<https://rodluger.github.io>



Björn Bräms
@bjornbrams
Professional student of Neurogenetics | Neurobiology | Neuroscience
#OpenScience | Open Access | BioRxiv
Regensburg | [bjornbrams.net](#) | Joined June 2009
958 Following | 8,073 Followers



Jon Tennant
@jonn Tennant
Norwegian ocean scientist. Latest book: [WTFisopenaccess.com...](#)
@fishanddata.com | Joined August 2011
842 Following | 17,3K Followers



Rebecca Willén
@rebeccawillen
Scientist & Psychologist. Founding Director @CIGORD Institute. Fan of science, scientists, independence and freedom.
Sweden | [rebeccawillen.com](#) | Joined July 2017
685 Following | 1,113 Followers

Podcasts



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#Science and Humanities, and their interaction with #society and #governance. Podcast and Twitter rotating curation @SfProgr, @DennisEckmair

Germany | [scienceforprogress.eu](#) | Joined August 2017

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Science

Open Science Talk | Norway | Host: Reviewer | Vert-Review | Publishing | Publishing | Open Data II | Open Data III | Open Data IV | Open Data V | Open Data VI | Open Data VII | Open Data VIII | Open Data IX | Open Data X | Open Data XI | Open Data XII | Open Data XIII | Open Data XIV | Open Data XV | Open Data XVI | Open Data XVII | Open Data XVIII | Open Data XVIX | Open Data XX | Open Data XXI | Open Data XXII | Open Data XXIII | Open Data XXIV | Open Data XXV | Open Data XXVI | Open Data XXVII | Open Data XXVIII | Open Data XXIX | Open Data XXX | Open Data XXXI | Open Data XXXII | Open Data XXXIII | Open Data XXXIV | Open Data XXXV | Open Data XXXVI | Open Data XXXVII | Open Data XXXVIII | Open Data XXXIX | Open Data XXXX | Open Data XXXXI | Open Data XXXXII | Open Data XXXXIII | Open Data XXXXIV | Open Data XXXXV | Open Data XXXXVI | Open Data XXXXVII | Open Data XXXXVIII | Open Data XXXXIX | Open Data XXXX

84 Following | 30

A journal about Open Science, Open Access, Open Education, Open Data, Open Software – pretty much open anything. This podcast is produced by the International Institute for Science, University of Vienna, Head is Erik Luehr.

[OpenScienceTalk.com](#)

TOOLS

Free Software

“Free software” means that the users have the freedom to run, copy, distribute, study, change and improve the software



Open Source Software

"The promise of open source is higher quality, better reliability, greater flexibility, lower cost, and an end to predatory vendor lock-in."



My Collection of Scientific Tools

<https://github.com/mxochicale/tools>

File	Description	Last Commit
meshviewer-ubuntu README.md	Create README.md	3 minutes ago
meshviewer	avrod	2 years ago
meshviewer	update	3 years ago
meshviewer	atom	2 years ago
meshviewer	meshviewer	3 years ago
meshviewer	meshviewer absolute	1 month ago
meshviewer	chroma	2 years ago
meshviewer	update	3 years ago
meshviewer	avroclac	4 months ago
meshviewer	update	3 years ago
meshviewer	meshviewer absolute.BSD	7 months ago
meshviewer	[internal] tutorial link	9 months ago
meshviewer	Update README.md	3 years ago
pandoc	pandoc	2 years ago
pandoc	pdfy -cute ubuntu.2004	6 months ago
pdfy	update	3 years ago
shovel	update	3 years ago
simplicialcomplexorder	simplicialcomplexorder	2 years ago
shape	shape viewer 20.04	4 months ago
terminator	terminator	4 months ago
venv	venv: installation and first venv file	2 years ago
vhs	vhs	2 years ago
HEAD.md	updates README.md	1 minute ago

My Collection Of Scientific Tools

This repository presents various tools that I have been using in my journey of becoming a scientist.

The tools we use have profound (and devious!) influence on our thinking habits, and therefore, on our thinking abilities

- Edgar W. Dijkstra, 1975. How do we tell truths that might hurt?

These are other tools that I am also familiar with:

- R is a language and environment for statistical computing and graphics.
- python is powerful, and plays well with others; runs everywhere; is friendly & easy to learn; is Open.
- LaTeX -[what4tex](#) is a document preparation system for high-quality typesetting.
- openCV Open Source Computer Vision Library
- htk The Hidden Matrix Model Toolkit (HTK)
- Forsm, the name produced from the two words FORMula TRANSLATION
- makehuman free and open source software to create realistic 3D humans
- orange Open source machine learning and data visualization for novice and expert
- voronoijs A fast JavaScript Voronoi diagram library
- deeplearning.js The Evolution and Activity Recognition Toolkit
- git Gesture Recognition Toolkit
- julia Open-Source Large Vocabulary CSR Engine Julia
- julia is a high-level, high-performance dynamic programming language for numerical computing.
- superCollider is a platform for audio synthesis and algorithmic composition.
- elab Animations on video and audio resources.

Contact

If you have specific questions about the content of this repository, you can contact [Miguel Kochicale](#). If your question might be relevant to other people, please instead [open an issue](#).

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 <https://github.com/mxochicale/tools>

The tools we use have profound (and devious!) influence on our thinking habits, and therefore, on our thinking abilities.

PHD THESIS

LATEX and vector files

LATEX

[mxochicale-phd / thesis](https://github.com/mxochicale-phd/thesis)

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Branch master · thesis / abstract / abstract.tex

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mxochicale [final version] CORRECTED VERSION TO BE EXAMINED

Filetree · on 20 May 2019

Locate file

31 lines (29 x3em) · 1.44 KB

```
1 \n ..... Thesis Abstract .....  
2  
3 \begin{abstract}  
4 Nonlinear analysis can be applied to investigate  
5 the dynamics of time-ordered data.  
6 Such dynamics relate to sensorimotor  
7 control and to the study of multi-channel interactions.  
8 Hence, this dissertation not only explores questions such as  
9 How to quantify movement variability  
10 or how different nonlinear analysis are appropriate  
11 to quantify movement variability  
12 but also how methods of nonlinear analysis are affected  
13 by real-world time series data (e.g., non-stationary, data length size,  
14 sampling frequency, etc.).  
15 Methods are explored to determine underlying parameters,  
16 reconstruct state spaces, recurrence plots and  
17 recurrence quantification analysis (RQA).  
18 Additionally, this thesis presents three dimensional surface plots of  
19 recurrence quantification analysis which to consider  
20 the variation of embedded parameters and recurrence thresholds.  
21 These plots show that the use of 3D surface plots of RQA  
22 surface plots of Shanon entropy might be a suitable approach  
23 to understand the dynamics of real-world time series data.  
24 The final part of this dissertation presents a command-line application  
25 where command codes can be pre-programmed with nonlinear analysis algorithms  
26 to evaluate. For instance, the improvement of movement performances,
```



[mxochicale-phd / thesis](https://github.com/mxochicale-phd/thesis)

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Latest commit 52c950a on 7 May 2019

File	Type	Created
sources	pre-submission	16 months ago
README.md	pre-submission	16 months ago
thesis-structure-v03.svg	first draft	2 years ago
thesis-structure-v04.svg	first draft	2 years ago
thesis-structure-v02.zig	thesis draft 1.5	2 years ago
thesis-structure-v02.zig	thesis draft v1.75	2 years ago
thesis-structure-v04.zig	thesis draft v2.00	17 months ago
thesis-structure-v03.zig	pre-submission	18 months ago
thesis-structure-v05.zig	pre-submission	18 months ago
thesis-structure-v05.svg	[final version] alpha version	10 months ago

README.md

Inkscape --export-pdf ..\PDF\outline.pdf thesis-structure-v05.svg Inkscape --export-pdf ..\PDF\fv05.pdf thesis-structure-v05.svg



github

Embedded code in Figures

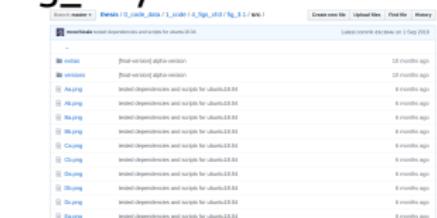
fig_3.1



fig_3.1/code



fig_3.1/src



fig_3.1/vector



Nonlinear Analysis

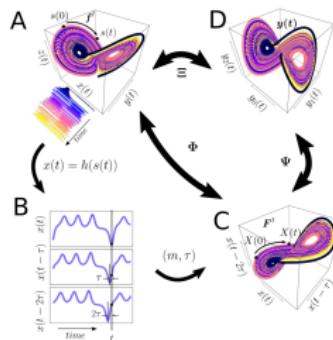


Fig. 3.1 State space reconstruction methodology: State space reconstruction is based on $x(t) = h[s(t)] = h[f^t(s(0))]$, where $h[\cdot]$ is a function $h : M \rightarrow \mathbb{R}$, defined on the trajectory $s(t)$; f is the true dynamical system; f^t is defined as evolution function and f^t , with time evolution $t \in \mathbb{N}$ which is the t -th iteration of f that corresponds to an initial position $s(0) \in M$. The time-delay embedding represented as Φ , maps the original d -dimensional state space M into a $(d-1)$ -dimensional uniform time-delay embedding matrix X ($X \in \mathbb{R}^{(d-1) \times d}$) which maps the original state space M into a new state space $y(t)$ of dimension $d-1$. Panel A shows a 3D phase space plot of the Lorenz system; (B) Delayed copies of the Lorenz attractor; (C) 3D reconstructed state space; (D) 3D transformed state space. Note that Φ is the delay coordinate map. This figure is based on Quintana-Durán (2012); Uzd et al. (1993).

transformations
Quintana-Durán
at [DOI](#).

More with GitHub



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DOI: 10.5281/zenodo.3284068. "To the Invention of a PhD Thesis"

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gitHub
GitHub community health files
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bing
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Nonlinear Analysis to Quantify Movement Variability in Human-Humanoid Interaction
Project Initiation: University of Birmingham, 2014-2019

Abstract
Nonlinear analysis can be applied to investigate the dynamics of time-varying data. Such dynamics relate to temporal variability in the movement of a system over time. This is particularly important in the field of robotics, as it is often the case that the movement variability or which methods of nonlinear analysis are apparently best suited to measured variables, but also how methods of nonlinear analysis can be applied to measure movement variability in a system. The present work focuses on the application of nonlinear analysis to describe interacting phenomena, nonstationary data spaces, movement patterns and nonlinear quantification analysis. Additionally, the work focuses on the development of a software system for nonlinear analysis of movement variability, named NALANAL. The main purpose of this software is to facilitate the analysis of movement variability in a system, by applying methods of nonlinear analysis to movement data. The NALANAL software provides a user friendly interface to implement the implementation of movement phenomena, to provide a practical method of skill learning or to quantify movement information and movement variability.

PHD Thesis

Github Repositories

Video Presentation

Citation



<https://github.com/mxochicale-phd/logo>

No description, website, or topics provided

Pages **Issues** **Milestones** **Commits** **Pull requests** **Branches** **Releases**

Code

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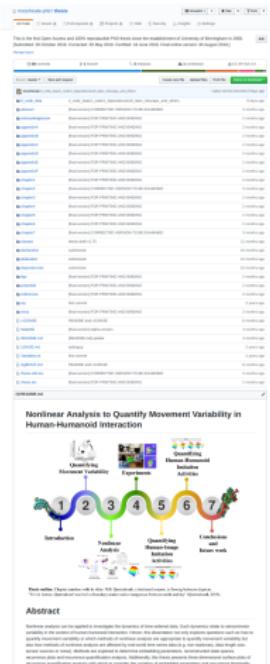
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References
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FIRST Open Access PhD Thesis at UoB (since 1900)



<https://github.com/mxochicale-phd/thesis>



OA PhD Thesis

- * LaTeX project
- * Vector files

OA SOFTWARE

- * R version 3.4.4 (2018-03-15)
- * R packages:
 - data.table
 - ggplot2
 - tseriesChaos
 - nonlinearTseries
 - RccArmadillo
- * GNU Octave 4.0.2



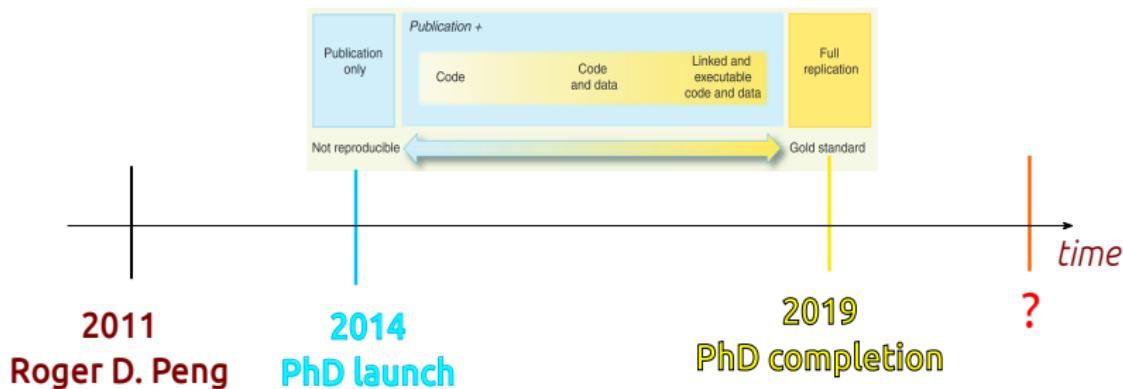
<https://doi.org/10.5281/zenodo.1473140>

Submitted: 26 October 2018/Corrected: 20 May 2019.

Certified: 18 June 2019/Final online version: 30 August 2019.

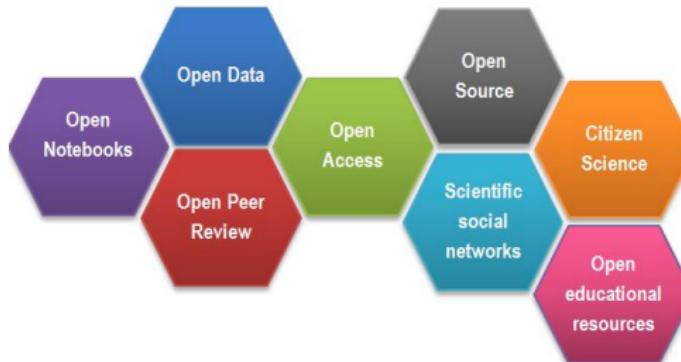
TAKEAWAYS

My journey in OA according to the Reproducibility Spectrum



Takeaways

1. How to start?: Reproduce a paper following ReScience
2. Use free and open source software as much as you can (happy to help!)
3. Follow, read, replicate, learn, fail, share and never stop exploring the exciting world of open access science!



References



Xochicale Miguel

» Nonlinear Analysis to Quantify Movement Variability in
Human-Humanoid Interaction «

Open Access Ph.D. Thesis (2019)

<https://github.com/mxochicale-phd/thesis>



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