Robert Austin Bruce Benn

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Education:

PhD Candidate in Biomedicine at the Centro Nacional Investigaciones Cardiovasculares
Translational Laboratory for Cardiovascular Imaging and Therapy
09/09/2015 – present Universidad Autónoma de Madrid, Madrid, Spain

Masters of Science in Molecular Biomedicine (MSc)
25/9/2014 – 15/6/2015 Universidad Autónoma de Madrid, Madrid, Spain

Bachelor's of Science in Biochemistry and Molecular Biology (B.S)
08/2009 – 05/25/2011 University of Vermont, Burlington, VT,USA
08/2011 – 09/05/2014 University of Georgia, Athens, GA, USA

Publications:

Fernández-Jiménez, R., C. Galán-Arriola, J. Sánchez-González, J. Agüero, G.J. López-Martín, S. Gomez-Talavera, J. Garcia-Prieto, [and 10 others including **Benn, R. Austin**] 2017. "Effect of Ischemia Duration and Protective Interventions on the Temporal Dynamics of Tissue Composition After Myocardial Infarction." *Circulation Research*. https://doi.org/10.1161/CIRCRESAHA.117.310901.

Basen, Mirko, Gerrit J. Schut, Diep M. Nguyen, Gina L. Lipscomb, **Robert A. Benn**, Cameron J. Prybol, Brian J. Vaccaro, Farris L. Poole, Robert M. Kelly, and Michael W. W. Adams. 2014. "Single Gene Insertion Drives Bioalcohol Production by a Thermophilic Archaeon." *Proceedings of the National Academy of Sciences* 111 (49): 17618–23. https://doi.org/10.1073/pnas.1413789111.

Preprints:

Messinger, Adam, Nikoloz Sirmpilatze, Katja Heuer, Kep Kee Loh, Rogier B Mars, Julien Sein, Ting Xu, [and 25 others including **R. Austin Benn**]. 2020. "A Collaborative Resource Platform for Non-Human Primate Neuroimaging." *BioRxiv*, January, 2020.07.31.230185. https://doi.org/10.1101/2020.07.31.230185.

Research Secondments:

07/01/2017-01/09/17 Oxford University Functional Magnetic Resonance of the Brain (FMRIB) Learned to perform advanced analysis of Functional Magnetic Resonance Imaging analysis in the group of Stephen Smith under Eugene P. Duff and developed techniques and pipelines to study the resting state networks of the pig.

Talks and Poster Sessions
9-6-2019
Poster Presentation at Organization of Human Brain Mapping
"Precon_all: A surface generation pipeline for use in preclinical research"

17-06-2018
Poster Presentation at Organization of Human Brain Mapping
"Bold and Pig Headed"
Poster presenting work on novel resting state networks in the pig brain.

30-9-2017
Spanish Society of Neuroscience
"Neuroimaging, Open Datasets, AI, and New Trends in Open Science and Good Practices"

Attendance of Professional Courses
fMRI Software Library (FSL): 06-2016
Statistical Parametric Mapping (SPM): 10-2015

Development and Maintenance of Open Source Software:

[Precon_all](#): 03/2018 – present
Primary Languages: Shell
Minor Languages: Python, MATLAB
Libraries Used: [FSL](#), [ANTs](#), [FreeSurfer](#), [Connectome Workbench](#)
Precon_all is a surface reconstruction pipeline originally developed for use with pigs but was extended to run on nearly any animal brain. One of the main issues in developing new animal models in neuroimaging is the lack of animal specific tools and the high level of expertise needed to adapt existing human tools to run on non-human brains. Precon_all pieces together multiple image processing libraries to simplify this process and recreates the output of the popular recon-all FreeSurfer pipeline including estimates of cortical thickness, curvature, and sulcal depth for animal brains. Thus far the pipeline has been used to reconstruct surfaces of the cerebral cortex for the: pig, dog, chimpanzee, gibbon, dingo, rhesus macaque, squirrel monkey, lemur, and mouse.

[T1ify](#): 03/2020 – present
Primary Languages: Python
Libraries Used: [Nipy](#), [Nilearn](#), [Pytorch](#)
Founded and led a team of 12 individuals in the T1ify project during the 2020 BrainWeb hackathon. T1ify uses deep learning to convert T2 weighted anatomical MRI images to T1 contrast and vice a versa. The project aim was to serve as a project to provide both a learning experience in applying deep learning to neuroimaging data and to enable the use of T2 images in surface reconstruction pipelines such as **precon_all**. The project is managed through mattermost channel and can be joined here:
https://mattermost.brainhack.org/brainhack/channels/t1ify .
[Exonet](#): 10-2019 – 12-2019
Primary Languages: Python
Libraries Used: [Lightkurve](#), [Pytorch](#)
Exonet applied convolutional neural networks to transient light curve data acquired from the Kepler deep space telescope missions to identify or confirm the existence of novel exoplanets. Using this approach two novel exoplanet candidates were identified, K01206.01, and K01861.01.

Organization of scientific events:
[The BrainWeb](#)**:** 04-2020 – present

Role: Co-founder/organizer
Online neuroscience hackathon organized to replace the in person meetings due to the COVID-19 quarantine. The event uses remote meeting platforms combined with the mattermost to promote ongoing collaboration and aid and organize new open source neuroinformatics projects.

[BrainHack Madrid:](#) 05-2018
Role Co-organizer
Organized and procured speakers for the Madrid event of the [BrainHack Global](#) initiative, and gave an overview talk of fMRI to participants. Approximately 30 participants came and work on neuroinformatics projects was carried out for 3 days.

Funding:

Supervising and Mentoring -*titles have been translated into English*

1. Natalia López Rojo. *Modulation of Resting State Networks as a Result of Remote Ischemic Preconditioning.* Universidad Politécnica de Madrid, Undergraduate Thesis, 2018-2019. Received *matricula de honor* and was nominated for the Arquimedes award for best undergraduate thesis in Spain.
2. Jose Pedro Manzano. *Analysis of Functional Brain Data Using New Paradigms of Spiking Neural Networks.* Masters Thesis. 2016-2017. Universidad Nacional de Educación a Distancia. Won the Arquimedes award for best the best Master's Thesis in Spain.
3. Inés Hojas García-Plaza. *Characterization of inflammation in a porcine model of ischemic stroke: immunofluorescence and MRI correlation.* Universidad Autonoma de Madrid, Undergraduate Thesis. 2016-2017

Journal Reviewing:
Neuroimage