Thijs L. van der Plas

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Education

University of Oxford, Department of Physiology, Anatomy and Genetics *Oxford, United Kingdom (UK)*

DPhil (PhD) Interdisciplinary Bioscience *2019 - present*

- Advisors: Adam Packer (Oxford), Tim Vogels (IST Austria), Andrew Saxe (Gatsby Unit, UCL, UK). College: St Edmund Hall.
- 1 year of courses and lab rotations (with Adam Packer, Sanjay Manohar & Tim Vogels).
- 3 years of dissertation research, primarily based in the lab of Adam Packer. Project title: *Neural mechanisms and functional purpose of dynamic dimensionality states in sensory cortex*.
- Analysis of high-dimensional neural systems using supervised learning, multi-task learning, recurrent neural networks and time-series analysis methods.

Radboud University, Donders Institution *Nijmegen, the Netherlands (NL)*

MSc Physics & Astronomy, Specialisation: Neuroscience *2016 - 2019*

- Advisors: Bernhard Englitz (Radboud), Georges Debrégeas (Sorbonne, Paris).
- Research thesis (60ECTS, graded 10/10) on uncovering neural assemblies in whole-brain data using Restricted Boltzmann Machines, titled: *Statistical models discover an accurate low-dimensional latent representation of zebrafish neural activity*.
- Strong focus on research output, with 2 publications (Current Biology & bioRxiv), 1 data visualisation tool (Bitbucket) and numerous conference contributions.
- Co-supervision of BSc and MSc students working on coding and data analysis projects.

Radboud University, Donders Institution *Nijmegen, NL*

BSc Physics & Astronomy, Minor: Neuroscience *2011 - 2016*

- Advisor: Bert Kappen (Radboud).
- Research thesis (12ECTS, graded 9/10) on latent variable inference of BOLD signals using control theory and importance sampling techniques, titled: *Exploring the Properties of the Smoothing Distribution of Stochastic Dynamic Causal Models for fMRI*.

Extracurricular education

University of Oxford, Oxford Climate Society & The Guardian *Virtual*

Oxford Net Zero Home School *Jun 2020*

- Course of 5 seminars on the road to achieving Net Zero emmissions.

University of Oxford, Oxford Climate Society *Oxford, UK*

The Oxford School of Climate Change *Jan-Mar 2020*

- Winter school of 8 lectures and discussion groups on various topics relating to climate change.

Ecole Normale Supérieure, QLife *Paris, France*

Neuronal Networks Winter School *Feb 2020*

- One week course of lectures and numerical workshops about current techniques of recording and analysing of neuronal network activity.

Moscow Higher School of Economics *Moscow, Russia*

Deep Bayes Summer School *Aug 2019*

- One week course of lectures and exercises about state-of-the-art concepts and techniques to train Deep Learning networks in a Bayesian framework.

Radboud University *Nijmegen, NL*

Neuroanatomy practical course *Aug 2018*

- One week hands-on human and rat brain dissection practical.

Humboldt-University, Bernstein Center *Berlin, Germany*

Ethics in Neuroscience Winter School *Feb 2018*

- One week course of lectures and discussion sessions about neuroscience topics that can raise ethical questions.

Publications

** equal contribution; † co-senior authors*

Van der Plas TL, Manohar S†, Vogels TP†, *Predictive learning enables neural networks to learn complex working memory tasks*. **Proceedings of Machine Learning Research** (accepted)

Rowland JM*, **Van der Plas TL***, Loidolt M*, Lees RM, Keeling J, Dehning J, Akam T, Priesemann V, Packer AM, *Perception and propagation of activity through the cortical hierarchy is determined by neural variability*. **bioRxiv** (2021), doi

Van der Plas TL*, Tubiana J*, Le Goc G, Migault G, Kunst M, Baier H, Bormuth V†, Englitz B†, Debrégeas G†, *Compositional Restricted Boltzmann Machines Unveil the Brain-Wide Organization of Neural Assemblies*. **bioRxiv** (2021), doi.

Migault G, **Van der Plas TL**, Trentesaux H, Panier T, Candelier R, Proville R, Englitz B, Debrégeas G and Bormuth V, *Whole-brain calcium imaging during physiological vestibular stimulation in larval zebrafish*. **Current Biology** (2018), doi.

Presentations

** equal contribution; † co-senior authors; + presenting author*

Invited and contributed talks

Feb 2022 **Van der Plas TL+**, *Predictive learning enables neural networks to learn complex working memory tasks*. **Sainsbury Wellcome Centre** (Invited talk for Saxe lab), London, UK

Feb 2021 Rowland JM+, Lees RM, Loidolt M, **Van der Plas TL**, Dehning J, Priesemann V, Packer AM, *Dimensionality of neural activity in sensory cortex predicts activity propagation and behaviour*. **Cosyne 2021** (Contributed talk), virtual.

Oct 2020 **Van der Plas TL+**, Vogels TP†, Manohar S†, *Emergent Sequential Task Learning Facilitates Convergence in Recurrent Neural Networks*. **Neuromatch 3** (Interactive Talk), virtual, abstract.

Jun 2020 **Van der Plas TL+**, Manohar S†, Vogels TP†, *Memory in RNNs: Uncovering Neural Mechanisms that Underpin Segregation of Sensation and Memory*. **VWMS 2020**, virtual, recording.

May 2020 **Van der Plas TL+**, Manohar S†, Vogels TP†, *Memory in RNNs: Uncovering Neural Mechanisms that Underpin Segregation of Sensation and Memory*. **Neuromatch 2** (Short Talk), virtual, recording.

Feb 2019 **Van der Plas TL+**, Englitz B, *Fishualizing large functional data*. **Janelia research campus** (Invited talk for Ahrens and Keller labs), Ashburn, Virginia, USA.

Jan 2019 **Van der Plas TL+**, *Generative modeling of zebrafish brain data to characterize brain states*. **Ecole Normale Supérieure** (Invited talk for Monasson lab), Paris, France

Oct 2018 **Van der Plas TL+**, *Generative modeling of whole-brain data to characterize brain states*. **Donders Discussions 2018** (functional connectivity session), Nijmegen, NL.

Poster presentations

Aug 2022 **Van der Plas TL+**, Manohar S†, Vogels TP†, *Predictive learning enables neural networks to learn complex working memory tasks*. **CoLLAs 2022**, Montreal, Canada.

Jul 2022 Loidolt M+*, Rowland JM*, **Van der Plas TL***, Lees RM, Keeling J, Dehning J, Akam T, Priesemann V, Packer AM, *Perception and propagation of activity through the cortical hierarchy is determined by neural variability*. **FENS Forum 2022**, Paris, France.

Jun 2022 **Van der Plas TL+***, Tubiana J*, Le Goc G, Migault G, Kunst M, Baier H, Bormuth V†, Englitz B†, Debrégeas G†, *Compositional Restricted Boltzmann Machines Unveil the Brain-Wide Organization of Neural Assemblies*. **Population models workshop**, Edinburgh, UK.

May 2022 **Van der Plas TL+***, Rowland JM*, Lees RM, Packer AM, *Generalisation of stimulus representation across somatosensory cortex areas in a cellular-resolution photostimulus detection task*. **DTC symposium**, Oxford, UK.

Jul 2020 **Van der Plas TL+***, Rowland JM*, Lees RM, Packer AM, *Generalisation of stimulus representation across somatosensory cortex areas in a cellular-resolution photostimulus detection task*. **CNS 2020**, virtual, abstract.

Jul 2020 Rowland J+*, Lees RM*, Loidolt M, **Van der Plas TL**, Dehning J, Priesemann V, Packer AM, *All-optical interrogation of neuronal activity transfer between somatosensory areas of the neocortex reported as salient*. **FENS Forum 2020**, virtual.

Sep 2019 **Van der Plas TL***, Tubiana J*, Migault G, Le Goc G, Bormuth V†, Englitz B†, Debrégeas G† *Statistical Models Discover an Accurate Low-Dimensional Latent Representation of Zebrafish Neural Activity*. **Bernstein Conference 2019**, Berlin, Germany., abstract.

Mar 2019 Migault G+, **Van der Plas TL+**, Trentesaux H, Panier T, Candelier R, Proville R, Englitz B, Debrégeas G and Bormuth V, *Whole-brain calcium imaging during physiological vestibular stimulation in larval zebrafish*. **Cosyne 2019**, Lisbon, Portugal, two-page abstract.

Dec 2018 Migault G+, **Van der Plas TL+**, Trentesaux H, Panier T, Candelier R, Proville R, Englitz B, Debrégeas G and Bormuth V, *Whole-brain calcium imaging during physiological vestibular stimulation in larval zebrafish*. **Zeebrain 2018**, Brighton, UK.

Dec 2018 Beiza N+, Panier T, Migault G, Trentesaux H, **Van der Plas TL**, Bormuth V, *Postural control mechanisms in larval zebrafish*. **Zeebrain 2018**, Brighton, UK.

Sep 2018 Migault G+, **Van der Plas TL+**, Trentesaux H, Panier T, Candelier R, Proville R, Englitz B, Debrégeas G and Bormuth V, *Whole-brain calcium imaging during physiological vestibular stimulation in larval zebrafish*. **Bernstein Conference 2018**, Berlin, Germany, abstract.

Awards, fellowships, & grants

PhD funding:

Jul 2021	**Graham Hamilton Travel Award**, St Edmund Hall	*£500*
2020, 2021	**St Edmund Hall College Grants**, St Edmund Hall	*£609*
Sep 2019	**BBSRC tuition fee studentship**, BBSRC	*£33,816*
Sep 2019	**DTC departmental scholarship**, BBSRC	*£60,036*

MSc funding:

Feb 2019	**Radboud Travel Grant**, Radboud University	*€250*
Mar 2018	**Laboratoire Jean Perrin funding**, Sorbonne University	*€2,790*
Mar 2018	**Erasmus+ grant**, European Union	*€2,353*

Feb 2016 **Nominated for best BSc Thesis in Physics**, Radboud University

Teaching experience

		Lecturer:
2022	**Modelling & Scientific Computing (1st year DPhil)**, Teaching Assistant (TA)	*Martin Robinson (Oxford)*
2021	**Introduction to Programming (1st year DPhil)**, TA	*Eoin Malins (Oxford)*
2020	**Introduction to Programming (1st year DPhil)**, TA	*Eoin Malins (Oxford)*
2018	**Introduction to Machine Learning (3rd year BSc)**, TA	*Bert Kappen (Radboud)*
2017	**Nonlinear Dynamics, Chaos & Applications (2nd year BSc)**, TA	*Paul Tiesinga (Radboud)*
2017	**Introductory Statistics (1st year BSc)**, TA	*Stefan Maubach (Radboud)*

Publicly available code

		Link to repository:
2022	**Reproducible Figures tutorial**, Systematic tutorial and presentation that I have developed on why Reproducible Figures should be the standard in science, and how to create them in Python.	*github*
2021	**Compositional Restricted Boltzmann Machine (cRBM)**, Python implementation of the cRBM model, a generative maximum-entropy model that uncovers an interpretable low-dimensional data representation.	*github*
2018	**The Fishualizer**, Python-based dynamic high-dimensional 3D data visualisation tool.	*bitbucket*

Related professional experience

2021-2022	**Ex Aula Research Journal**, Editor	*St Edmund Hall, Oxford, UK*
2020-2021	**World Wide Neuro Neurotheory**, Host of 2 seminars	*Virtual*
2019	**Radboud University, Donders Institute, Englitz Lab**, Research Assistant	*Nijmegen, NL*
2018	**Sorbonne University, Laboratoire Jean Perrin**, Research internship	*Paris, France*
2016-2017	**Radboud University**, Open Days Student Representative	*Nijmegen, NL*