Dr. Willem Bonnaffé

Postdoctoral data scientist
Big Data Institute, Old Road Campus
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WORK

2021-2022 — **Postdoctoral Data Scientist** — **University of Oxford**
Morpho-molecular signature of prostate cancer — Big Data Institute
Image analysis - Multi-instance learning - Segmentation

2021, 4 months — **Research assistant in AI & remote sensing** — **University of Oxford**
Building ML tools to analyse forest canopy drone imagery — Department of Zoology
Image processing - Image recognition - Classification

2020-2022 — **Director & Lead on AI solutions** — **Eltanin Martime Analytics**
AI solutions to predict weather disruptions in ports — & Oxford University Innovation
Won 2020 Oxford AI impact hackathon for climate change

2016-2017, 10 months — **Research assistant in Mathematical Biology** — **University of Arizona**
Modelling evolution of tropical fish communities — Ecology and Evolutionary Biology Dpt.
Bayesian modelling - MCMCMH/HMC - IBMs

EDUCATION

2017-2021 — **DPhil in AI & Environmental Sciences** — **University of Oxford**
Inferring eco-evolutionary feedbacks in nature — NERC DTP & Department of Zoology
Expertise in AI analysis of time series data — Pr. B. Sheldon & Pr. T. Coulson

2013-2017 — **Diploma in Socio-Environmental Sciences** — **Ecole normale supérieure Ulm**
Expertise in water and fish stock management — Environmental Research and
Policy assessment - Agent-based modelling — Teaching Institute

2013-2016 — **MSc in Evolutionary Biology** — **Ecole normale supérieure Ulm**
$1^{st}/49$ written exams - Highest honors — & **Université Pierre et Marie Curie**
Advanced training in stat./mathematical modelling

2011-2013 — **BSc in Life Sciences** — **Université Pierre et Marie Curie**
$5^{th}/505$ written exams - High honors
General training in Chemistry, Physics, Biology

SKILLS

I.T. Vim - LaTeX - Beamer - Word - Excel - Powerpoint
Programming R - C/C++ - Bash - Python - NetLogo - MatLab - Julia - Mathematica
Machine learning Classification - Time series - NODEs - ResNets - RNNs - CNNs
Languages French/English - German (basics) - Dutch (basics)
Skills Jazz guitar, performance, composition - Impressionist soft pastel painting - Fly fishing

CONFERENCES

2022 Dec.	**Human-AI Interaction in Bio-Medicine** Co-organizer with Dr. Yang Hu	**The Alan Turing Institute** Oxford
2021 Dec.	**BES meeting** Poster (*Fast NODE fitting*)	**British Ecological Society** London
2020 Dec.	**Festival of Ecology** Speaker (*Eco-evo feedbacks in Darwin's finches*)	**British Ecological Society** London
2020 Oct.	**Evol. Demogr. Society's 7th annual meeting** Invited speaker (*AI applied to Evol. dynamics*)	**Norwegian University of Sc. and Tech.** Centre for Biodiversity Dynamics
2018 Dec.	**NERC grand challenges seminar series** Co-organized conference on Science and Politics	**University of Oxford** NERC DTP & Jesus College
2017 June	**Trophic network research showcase** Speaker (*Trophic networks and thermal gradients*)	**Université Pierre et Marie Curie** Institute of Ecology and Environmental Sc.
2017 April	**Uncertainity Quantification showcase** Speaker (*Bayesian analysis of ecological data*)	**University of Arizona** Department of Mathematics

TEACHING

2020 2 weeks	**Demonstrator in doctoral course** Machine learning modules	**University of Oxford** Doctoral Training Center
2019-2020 6 months	**Tutor and demonstrator in undergrad. course** Quantitative methods (2nd year BSc in Biology)	**University of Oxford** Dpt. of Zoology
2018 6 weeks	**Demonstrator in doctoral course** Quantitative and computational methods	**University of Oxford** NERC DTP

EXPERIENCE

2016 5 months	**Internship in System Biology** *Trophic network topology along thermal gradients* Network theory - statistical modelling - bib. review	**Université Pierre et Marie Curie** Institute of Ecology and Environmental Sciences
2015 4 months	**Internship in Computational Biology** *Fisheries and trout meta-population dynamics* Agent-based models C_{++} - numerical simulations	**Ecole normale supérieure Ulm** Environmental Research and Teaching Institute
2014-2015 6 months	**Internship in Functional Ecology** *Ontogeny of body colouration in lizards* Spectrophotmetry - statistical modelling	**Université Pierre et Marie Curie** Institute of Ecology and Environmental Sciences
2014 5 months	**Internship in Behavioural Ecology** *Fitness consequences of sociality* Fieldwork - statistical modelling - network theory	**University of Oxford** Department of Zoology
2013 2 months	**Internship in Cognitive Ethology** *Detection of prosocial behaviour in rodents* Supervision of experiments - animal care	**Muséum national d'histoire naturelle** Laboratoire d'Ethologie Cognitive et Comparée

PUBLICATIONS

2022	*Morphological signature of cancer evolution in prostate cancer* W. Bonnaffé et al.	In prep.
2022	*Inferring eco-evolutionary feedbacks from time series data* W. Bonnaffé & T. Coulson	In prep.
2022	*Single chain differential evolution Monte-Carlo for self-tuning Bayesian inference* W. Bonnaffé	Under review at Environmental and Ecological Statistics
2022	*Fast fitting of neural ordinary differential equations by Bayesian gradient matching to infer ecological interactions from time series data* W. Bonnaffé & T. Coulson	Under review at Methods in Ecology and Evolution
2021	*Species richness and network structure jointly drive total biomass and its temporal stability in fish communities* A. Danet, E.Thebault, W. Bonnaffé, M. Mouchet & O. Collin	Ecology Letters
2021	*Neural Ordinary Differential Equations for Ecological and Evolutionary time series analysis* W. Bonnaffé, B.C. Sheldon & T. Coulson	Methods in Ecology and Evolution
2021	*Comparison of size-structured and species-level trophic networks reveals antagonistic effects of temperature on species-level response to temperature* W. Bonnaffé, S. Legendre, A. Danet, & E. Edeline	Oikos
2018	*Ontogenetic trajectories of body colouration reveal its function as a multicomponent non-senescent signal* W. Bonnaffé et al.	Ecology and Evolution