Tim CD Lucas

PERSONAL INFORMATION

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PRESENT APPOINTMENT

2016–Present	**University of Oxford, Malaria Atlas Project**
Post Doc.	My current position is as a postdoctoral research scientist in geospatial epidemiology with the Malaria Atlas Project at the University of Oxford. I use spatial statistics and machine learning methods to map infectious and vector borne diseases.

PREVIOUS APPOINTMENTS

Jan–July 2016	**CBER, UCL**
Research Programmer	I was the staff programmer for the Centre of Biodiversity and Environment Research at UCL. I worked on two main projects. I worked with the Madingley Model—an ecological model of all life, written in C# to enable this model to run on the *high performance cluster* at UCL. Secondly, I translated code from *Mathematica to R* for analyses of measurements of 3D objects used in *paleontological research*. I also provide technical support for the rest of the department.

EDUCATION

2012–2016	**University College London, CoMPLEX**
PhD	*The role of population structure and size in determining bat pathogen richness* I used *network epidemiological models* and phylogenetic statistical methods to study the epidemiology of bat-borne diseases. As bats carry a number of important *zoonotic diseases*, including Nipah and Ebola, understanding the spread of these diseases within bat population and how this affects spillover to humans and livestock is increasingly important. [pdf] Supervisors: PROF. KATE JONES & DR HILDE HERBOTS
2011–2012	**University College London, CoMPLEX**
MRes	*Modelling Biological Complexity* · **M**erit Projects included adapting '*ideal gas*' models to acoustic data, analysing moment closures for a *pair-approximation* model of plant ecology and applying a novel *machine learning* method to a library of bat calls.
2006–2010	**University of Sheffield, Animal & Plant Sciences**
MBioSci	*Zoology* · **First** For my final project I used *wavelet* analysis to study multi-annual *cycles in malaria* incidence in Thailand.

OTHER RESEARCH EXPERIENCE

Autumn 2014 Zoön: An R package for reproducible SDMs

Internship I wrote the first version of an R package for *reproducible* species distribution modelling. The package uses an online repository of user submitted 'modules' to allow the software to keep up with this fast moving field and allow analyses to be completely reproducible. [Github]

2011 Smithsonian Tropical Research Institute and Chiloé Silvestre, Chilé

Volunteer Fieldwork Two months fieldwork in Panamá on two projects: studying *Anolis* dewlap evolution and studying gut length plasticity in Red-eyed tree frogs. I also spent two weeks trapping Darwin's foxes in Chilé to collect samples for geophylogenetics.

August 2010 University of Sheffield

Summer Internship I studied the evolutionary response of plant communities to climate change with Dr Raj Whitlock. I collected, propagated and analysed plants collected from the field.

August 2009 University of York, YCCSA

TRANSIT Internship I studied collective foraging behaviour by programming a *complex 3D foraging model* in Java and running simulations on a cluster at the York Centre for Complex Systems Analysis.

OTHER APPOINTMENTS AND AFFILIATIONS

Peer Review *Journals Reviewed for:*

· Methods in Ecology and Evolution, PLoS Pathogens, National Academy Science Letters

PUBLICATIONS

2017 **Lucas TCD**, Herbots HM, & Jones KE. *Role of inter-related population-level host traits in determining pathogen richness and zoonotic risk.* [preprint]

Redding D, **Lucas TCD**, Blackburn T & Jones KE. *Evaluating Bayesian spatial methods for modelling species distributions models with clumped and restricted data.* [preprint]

Golding N, August TA, **Lucas TCD**, Gavaghan DJ, van Loon EE & McInerny G. (2017) *The zoon R package for reproducible and shareable species distribution modelling.* Methods in Ecology and Evolution. doi: 10.1111/2041-210X.12858 [pdf]

2015 **Lucas TCD***, Moorcroft EA*, Freeman R, Rowcliffe MJ & Jones KE. (2015) *A generalised random encounter model for estimating animal density with remote sensor data.* Methods in Ecology and Evolution. doi: 10.1111/2041-210X.12346 [pdf]

2013 Walters CL, Collen A, **Lucas TCD**, Mroz K, Sayer CA and Jones KE. (2013) Challenges of Using Bioacoustics to Globally Monitor Bats. in *Bat Evolution, Ecology, and Conservation.* Springer New York. 479-499.

* Co-first authors.

CONFERENCES

2016	*Population structure and pathogen richness in bats.* Presentation at Epidemics5, Elsevier by **Lucas TCD**
	Using gas models to model camera trap and acoustic sensor surveys. Presentation at Statistical Ecology Research Festival, University of Kent by **Lucas TCD**
2015	*The Zoön Project: Reproducible, Remixable and Shareable Species Distribution Modelling with R.* Presentation at BES Annual Meeting by August T, Golding N, **Lucas TCD**, Gavaghan D, Isaac N, O'Hara B, van Loon E & McInerny G
	Simple, Shareable and Reproducible Species Distribution Modelling with the Zoön R package. Poster at BES Annual Meeting by Golding N, **Lucas TCD**, August T, Gavaghan D, Isaac N, O'Hara B, van Loon E & McInerny G
	Comparative and computational studies of pathogen richness in bats. Presentation at Research in Progress, RSTMH by **Lucas TCD**, Herbots H & Jones KE.
	A comparative and computational study of population structure and pathogen richness in bats. Presentation at Epidemics5 conference by **Lucas TCD**, Herbots H & Jones KE.
	An ideal gas model for estimating absolute abundances from bat detector data. Presentation at the National Bat Conference. [slides]
	Pathogen diversity and bat population structure. Poster at British Parasitological Society Autumn Meeting.
	Estimating abundance from camera traps and acoustic sensors. Presentation at CEH, Wallingford seminar series.
2014	Presentation at id2oxford conference. [slides]
	Poster at the CoMPLEX conference. [pdf]
2013	Presentation at BritBats 2 [slides].
	Invited attendance at ecoVIZ Tansley workshop.
	Poster at the CoMPLEX conference and id2 conference. [pdf]

SOFTWARE

On CRAN	**L**ucas TCD, Redding D (2017) *INLAutils: Utility Functions for 'INLA'* . www.github.com/timcdlucas/INLAutils
	Goswami A, **L**ucas TCD, Sivasubramaniam P, Finarelli J (2016) *A Maximum Likelihood Approach to the Analysis of Modularity*. www.github.com/timcdlucas/EMMLi
	Lucas TCD, Goswami A (2016) *paleomorph: Geometric Morphometric Tools for Paleobiology*. www.github.com/timcdlucas/paleomorph
	August T, **L**ucas TCD, Golding N, van Loon E, McInerny G (2015) *Zoön: Reproducible, Accessible & Shareable Species Distribution Modelling*. www.github.com/zoonproject/zoon
	Lucas TCD (2015) *palettetown: Use Pokemon Inspired Colour Palettes* www.github.com/timcdlucas/palettetown

TEACHING

2017 · Wrote and gave a two day workshop 'Geospatial statistics with R and INLA' at UiTM, Malaysia.

2015 · Demonstrator for reproducible species distribution modelling workshop run by Quantitative Ecology special interest group at BES.

2013–2014 · Online tutor for SysMIC, a course for teaching quantitative skills to biologists.

COMPUTATIONAL SKILLS

Statistical methods	Geospatial statistics, machine learning, Bayesian inference.
Languages	R (eight years), Python, Matlab, Mathematica, Java, SQL.
OS	Comfortable with Windows, Mac or Linux.
Other	Experience in R package development, Git/Github, unit testing, continuous integration, LaTeX, web design, markdown, shell/ssh and high performance computing.

REFEREES

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