Aula 16 Goodies*

* Goodies related to animals, plants and numbers…

https://www.st-andrews.ac.uk/subjects/biology/animal-behaviour-msc/

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Subjects

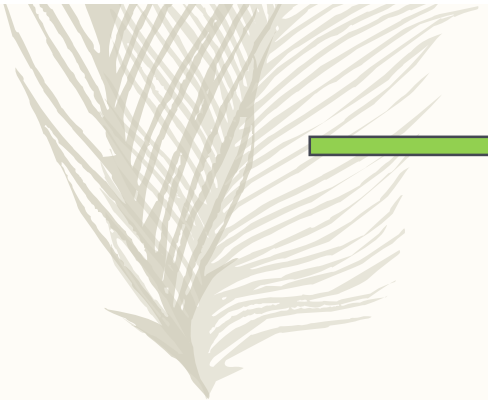
Study options | Non-degree courses | Entry requirements | Qualification indicator | Academic entry explained

University > Subjects > Biology > Animal Behaviour MSc

Animal Behaviour (MSc) 2020 entry

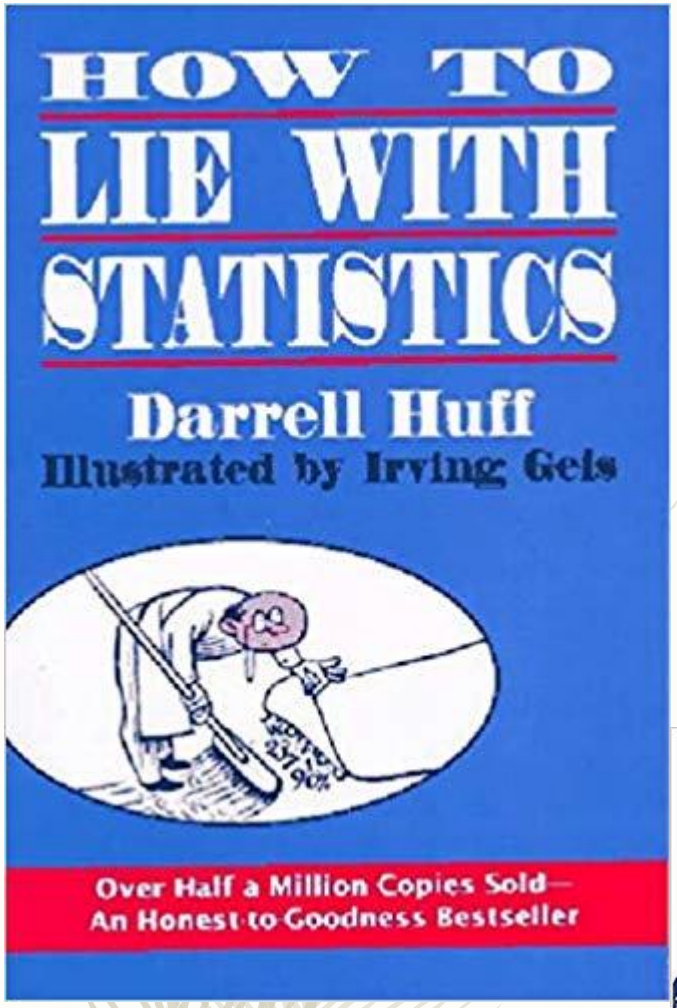
This MSc programme provides an intellectual and practical overview of modern animal behaviour research taught by leaders in their fields. It prepares students for conducting research into animal behaviour, covering key topics such as cognition, behavioural ecology and movement ecology, as well as the latest techniques used to study these.

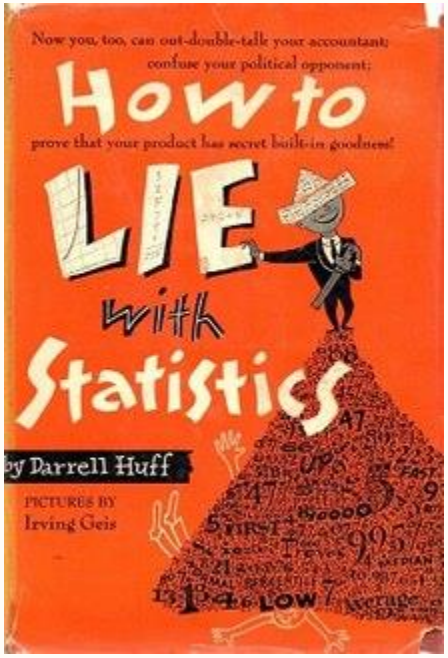
Apply now

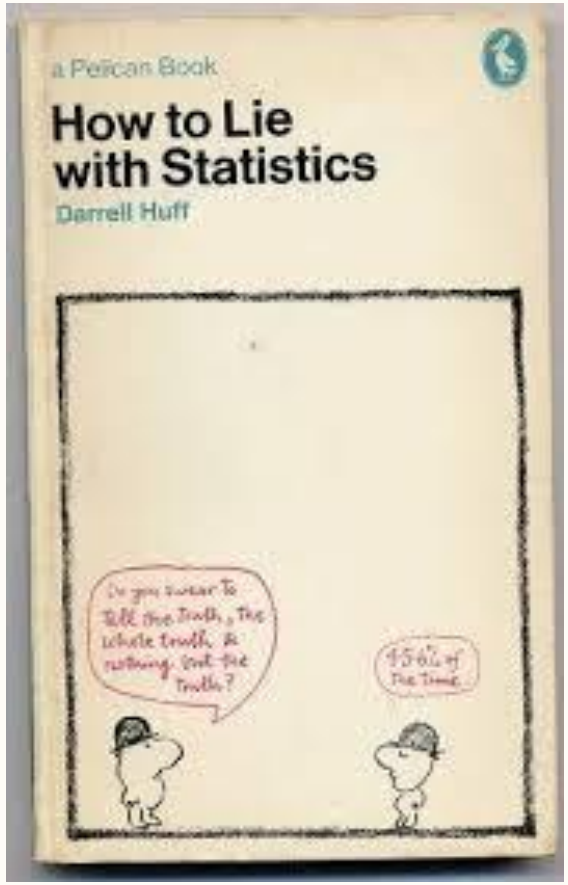


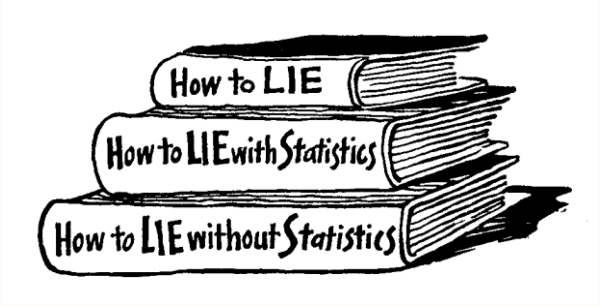
Entry requirements

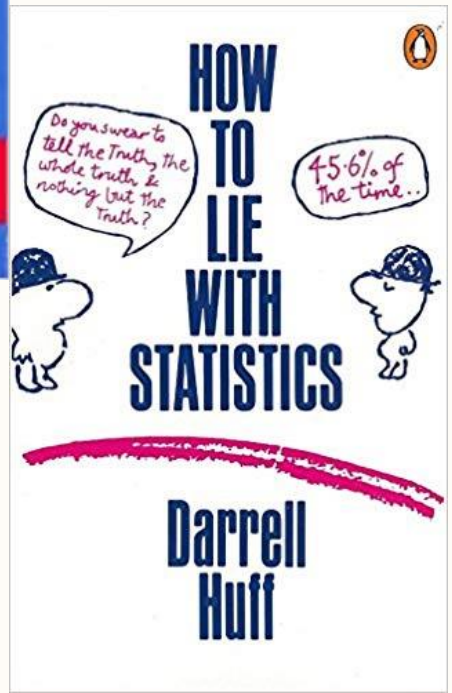
- A first or upper 2.1 (Honours) undergraduate degree in a biological science. Other science or mathematics degrees may be acceptable. If you studied your first degree outside the UK, see the **international entry requirements**.
- Evidence of training in advanced mathematics and statistics (at least to UK school AS/A-level, Higher, International Baccalaureate or equivalent).
- Very good baseline IT skills including word-processing, spreadsheet use, email and internet.
- English language proficiency. See **English language tests and qualifications**. If you require a visa to study, see **visas information**.


HOW TO
LIE WITH
STATISTICS
Darrell Huff
Illustrated by Irving Geis
Over Half a Million Copies Sold—
An Honest-to-Goodness Bestseller


Now you, too, can out-double-talk your accountant;
confuse your political opponent;
How to
prove that your product has secret built-in goodness!
LIE
with
Statistics
by Darrell Huff
PICTURES BY
Irving Geis


a Pelican Book
How to Lie
with Statistics
Darrell Huff

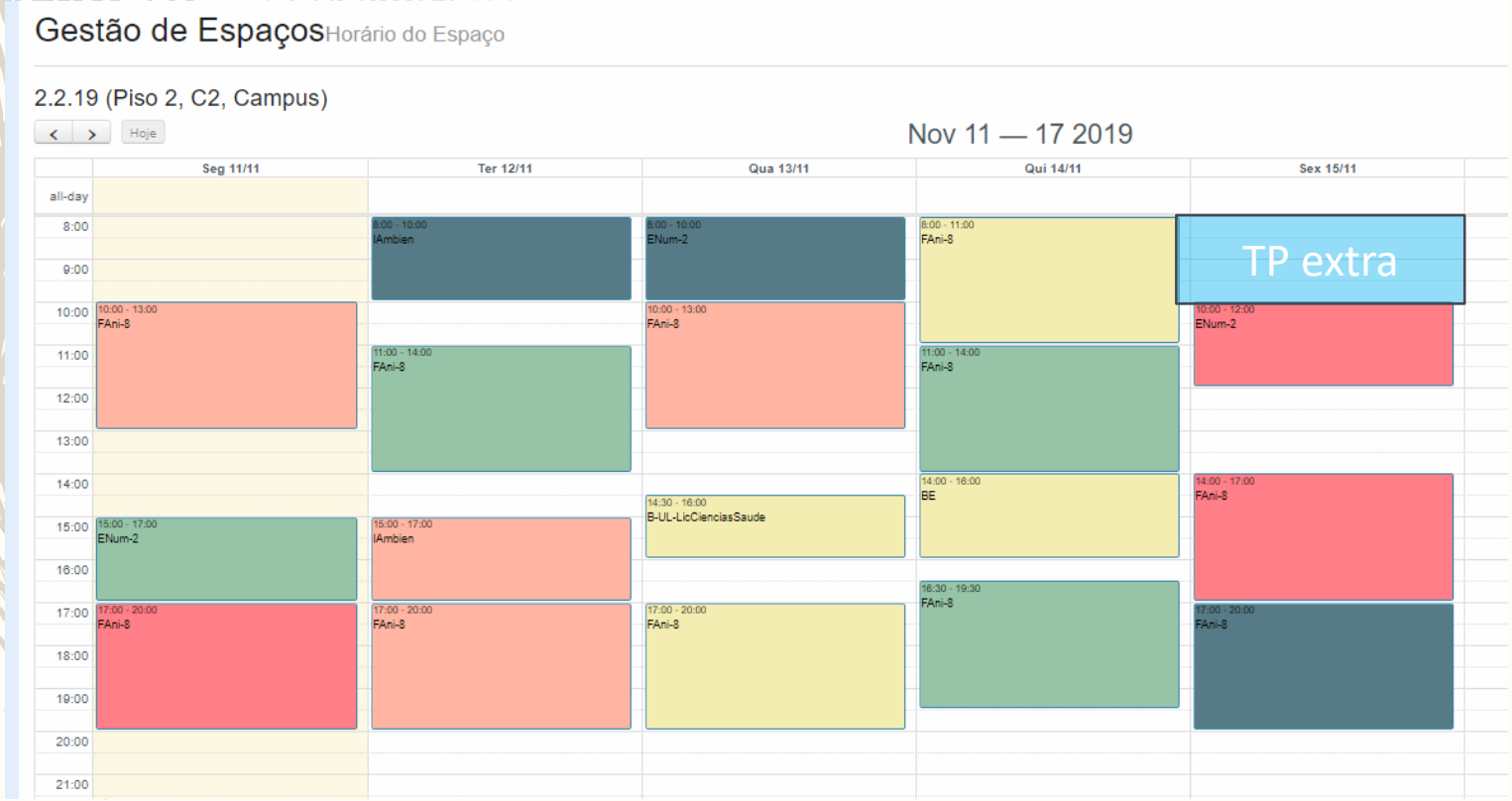

How to LIE
How to LIE with Statistics
How to LIE without Statistics


HOW
TO
LIE
WITH
STATISTICS
Darrell
Huff

FRANK WAS RIGHT NOT TO TRUST STATISTICS...
THE NUMBERS LIE!

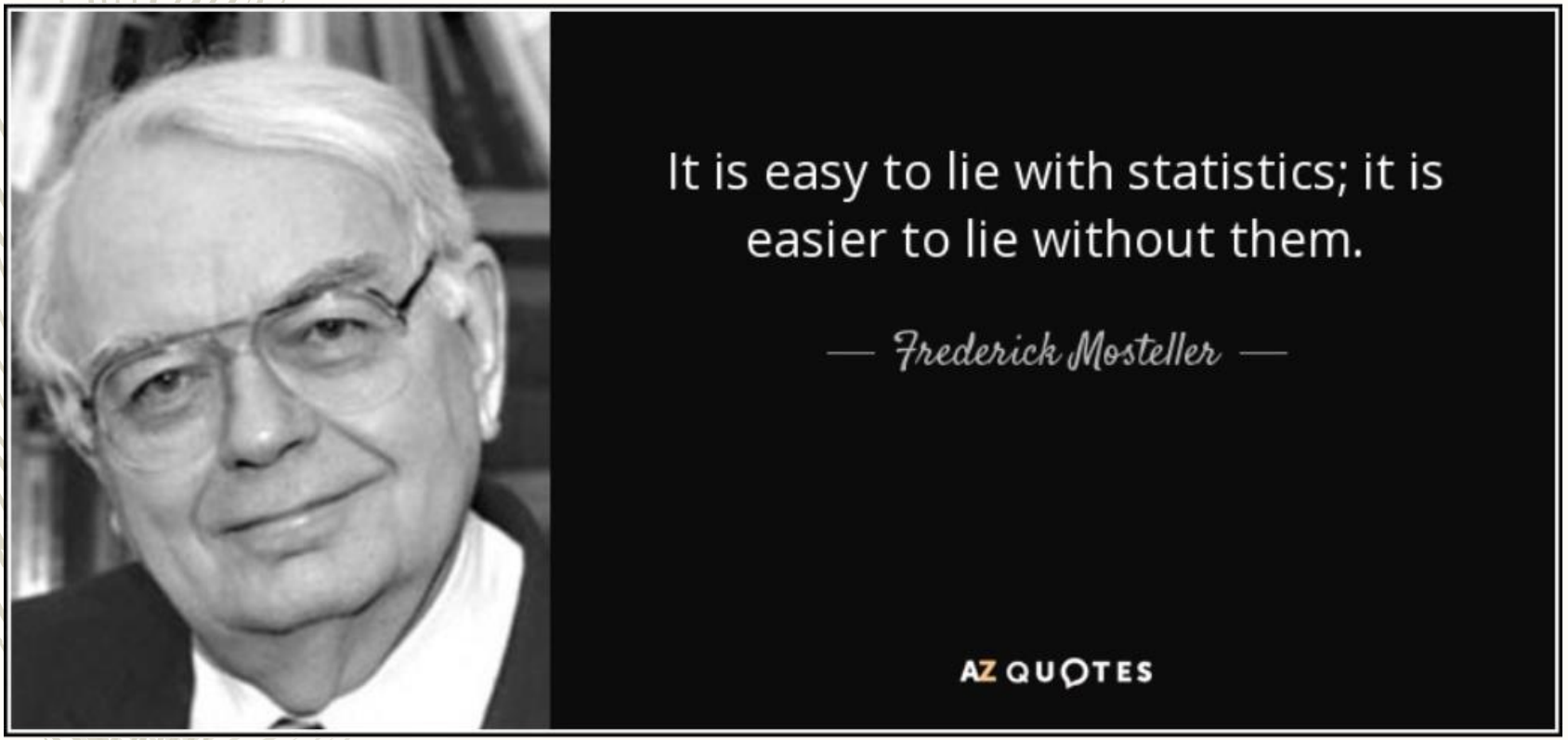
AVISO À NAVEGAÇÃO – TP de SEXTA FEIRA

Esta semana – dia 15 Nov 2019
Aula suplementar das 8:00-10:00 (FT6.pdf)
Aula normal das 10:00-12:00 (FT7.pdf)




How was your vacation?
I'm analyzing it now. The photo only got eight 'likes' but one of them was from someone really influential.
Originally published on Zoomph.com
Blazek
© Dave Blazek for MetroStar

Ecologia Numérica - Aula Teórica 16 – 11-11-2019



https://www.azquotes.com/quote/819974

Comparação de dois coeficientes de regressão (declives)

Hipótese: $H_0: \beta_1 = \beta_2$
$H_1: \beta_1 \neq \beta_2$

Estatística de teste:

$$t = \frac{\hat{\beta}_1 - \hat{\beta}_2}{s_{\hat{\beta}_1 - \hat{\beta}_2}}$$

onde

$$s_{\hat{\beta}_1 - \hat{\beta}_2} = \sqrt{\frac{(s^2_{Y.X})_p}{(\sum x^2)_1} + \frac{(s^2_{Y.X})_p}{(\sum x^2)_2}}$$

e

$$(s^2_{Y.X})_p = \frac{(SQ_{RESIDUAL})_1 + (SQ_{RESIDUAL})_2}{(gl_{RESIDUAL})_1 + (gl_{RESIDUAL})_2}$$

Valor crítico:

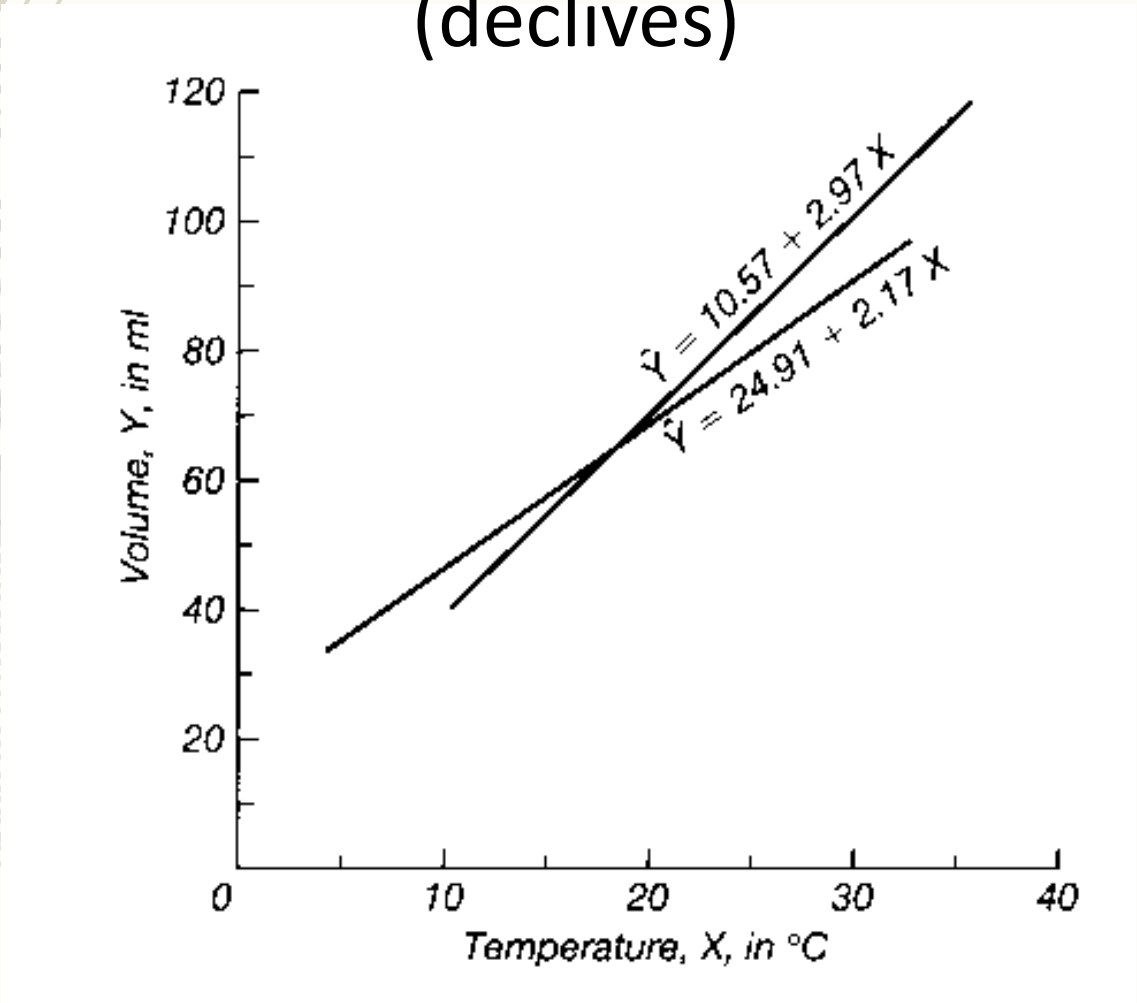
$$t_{\alpha(2),(n_1+n_2-4)}$$

Critério de decisão:

Rejeitar H_0 se: $t > t_{\alpha(2),(n_1+n_2-4)}$

Não rejeitar H_0 caso contrário

Comparação de dois coeficientes de regressão (declives)



Alguns aspectos adicionais sobre regressão

- Variáveis "Dummy" (O R faz isto por nós)
- Interacção entre variáveis independentes (multicolinearidade – avaliar a correlação e retirar a menos ecologicamente relevante)
- Outros métodos alternativos em relação ao MMQ (máxima verosimilhança, REML)
- Modelos não lineares

Generalized Linear Models

R in Ecology and Evolution

Examples of R code for problems in Ecology and Evolution

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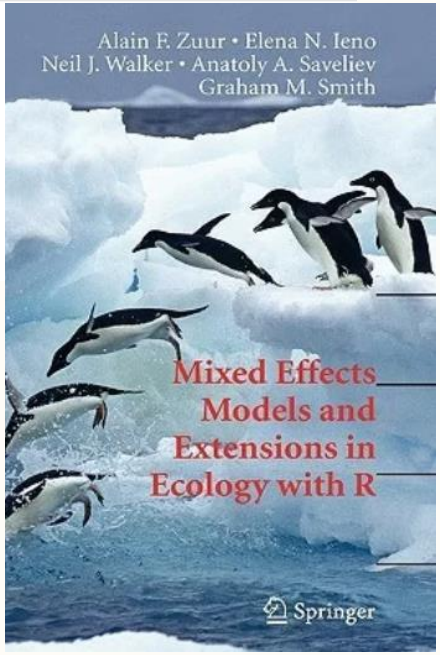
Sunday, May 14, 2017

A gentle introduction to Generalized Linear Models in R

What are generalized linear models?



http://r-eco-evo.blogspot.com/2017/05/generalized-linear-models.html
http://spatialecology.weebly.com/r-code--data/category/glm

GLM (generalized linear models)

- Generalização do modelo linear, pela capacidade de integrar distribuições dos erros não normais

- O incumprimento dos pressupostos do modelo linear simples é extremamente frequente pelo que os GLM são de extrema utilidade

GLM (generalized linear models)

Um GLM tem 3 elementos principais:

- Distribuição de probabilidade (da família exponencial) para a variável resposta
- Preditor linear
- Função de ligação (link function)

$$\mathrm{E}(\mathbf{Y}) = \boldsymbol{\mu} = g^{-1}(\mathbf{X}\boldsymbol{\beta})$$

GLM (generalized linear models)

Common distributions with typical uses and canonical link functions

Distribution	Support of distribution	Typical uses	Link name	Link function
Normal	real: $(-\infty, +\infty)$	Linear-response data	Identity	$\mathbf{X}\boldsymbol{\beta} = \mu$
Exponential Gamma	real: $(0, +\infty)$	Exponential-response data, scale parameters	Inverse	$\mathbf{X}\boldsymbol{\beta} = \mu^{-1}$
Inverse Gaussian	real: $(0, +\infty)$		Inverse squared	$\mathbf{X}\boldsymbol{\beta} = \mu^{-2}$
Poisson	integer: $[0, +\infty)$	count of occurrences in fixed amount of time/space	Log	$\mathbf{X}\boldsymbol{\beta} = \ln(\mu)$
Bernoulli	integer: $[0, 1]$	outcome of single yes/no occurrence	Logit	$\mathbf{X}\boldsymbol{\beta} = \ln\left(\frac{\mu}{1-\mu}\right)$
Binomial	integer: $[0, N]$	count of # of "yes" occurrences out of N yes/no occurrences		
Categorical	integer: $[0, K)$	outcome of single K-way occurrence		
	K-vector of integer: $[0, 1]$, where exactly one element in the vector has the value 1			
Multinomial	K-vector of integer: $[0, N]$	count of occurrences of different types (1 .. K) out of N total K-way occurrences		

Regressão logística (um exemplo de GLM)

• Modelo de regressão que tem como objetivo modelar ou prever valores de uma variável categórica (em geral binária), com base numa série de variáveis explicativas contínuas e/ou binárias

• Modelo logístico é usualmente sinónimo de modelo logit ou classificador de máxima entropia

• Modelo com muitas aplicações:

Determinar os factores que caracterizam um grupo de indivíduos doentes em relação a indivíduos saudáveis

Modelar presença ausência de espécies

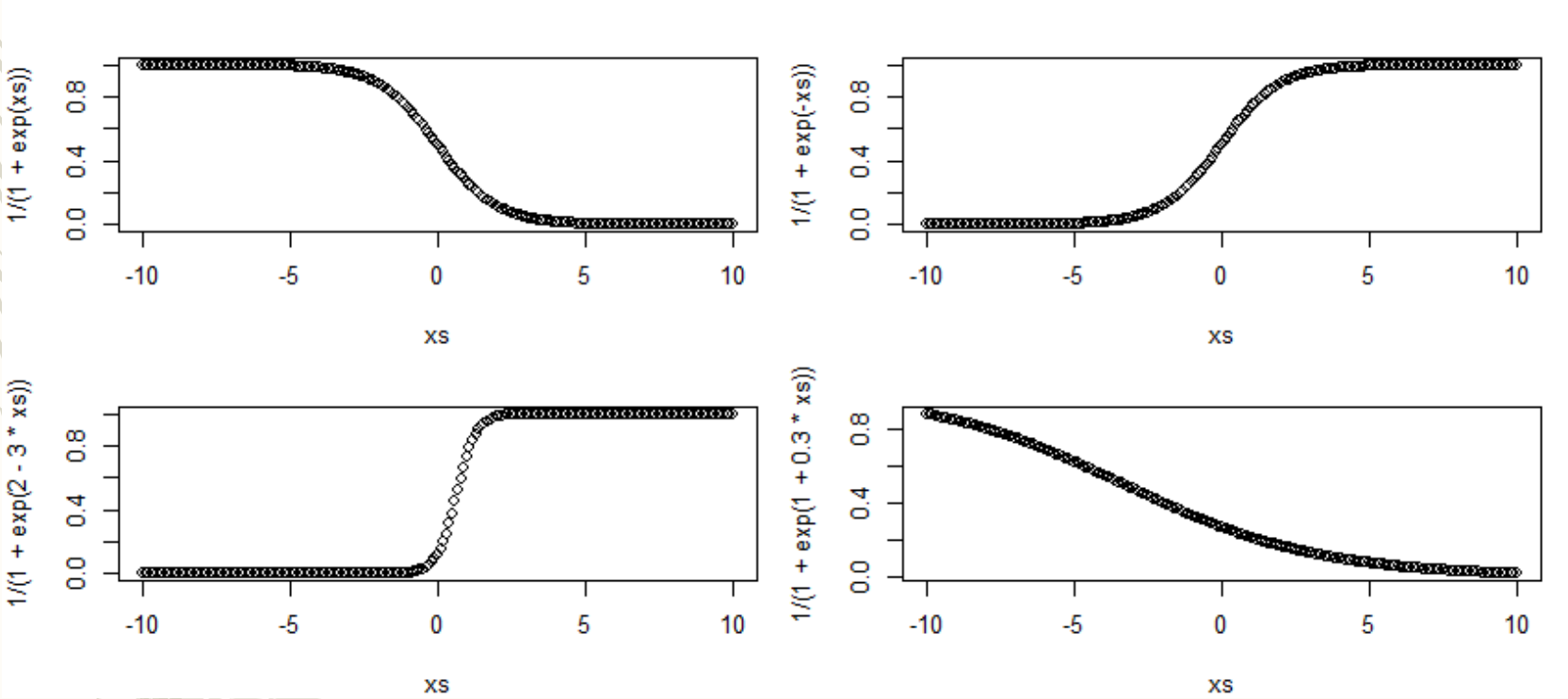
Intenções de voto em actos eleitorais.

Mortalidade/sobrevivência de indivíduos face a determinadas condições ambientais (e.g. contaminantes).

Regressão logística

$$\text{logit}(p) = \log\left(\frac{p}{1-p}\right)$$

$$\text{logit}^{-1}(\alpha) = \text{logistic}(\alpha) = \frac{1}{1+\exp(-\alpha)} = \frac{\exp(\alpha)}{\exp(\alpha)+1}$$



$$\text{logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i} \Rightarrow p_i = \frac{1}{1+\exp(\beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k)}$$

Conservation Biology

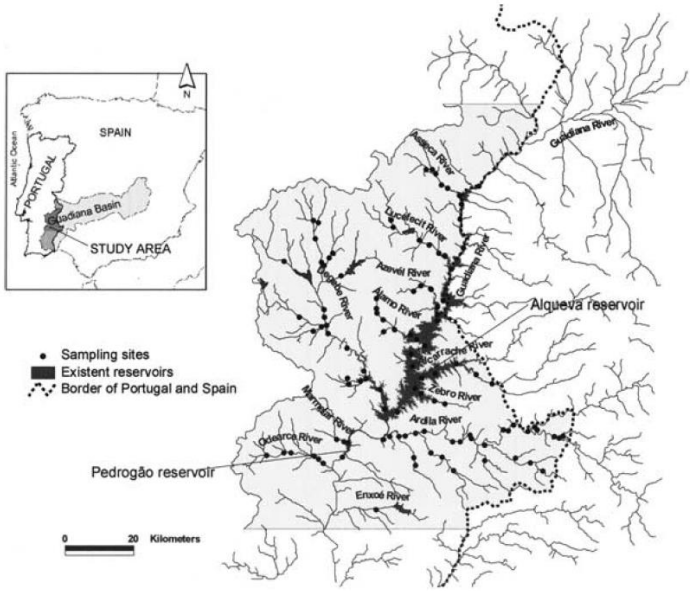
Full Access

Selection of Priority Areas for Fish Conservation in Guadiana River Basin, Iberian Peninsula

Selección de Áreas Prioritarias para la Conservación de Peces en la cuenca del Río Guadiana, Península Ibérica

A. F. FILIPE, T. A. MARQUES, , P. TIAGO, F. RIBEIRO, L. MOREIRA DA COSTA, I. G. COWX, M. J. COLLARES-PEREIRA

First published: 30 January 2004 | https://doi.org/10.1111/j.1523-1739.2004.00620.x | Cited by: 71



The conservation value of each area j ($j = 1, \ldots, N$) (VA_j) across the study region was calculated as the sum of the products of the probability of occurrence of each species at each area and the corresponding species conservation value (VS_k):

$$VA_j = \sum_{k=1}^{S} (P_{kj} \times VS_k),$$

where P_{kj} is the probability of occurrence of species k in area j and VS_k is the conservation value of species k. The conservation value of area j varies between 0 and 100.

than occurrence alone. Therefore, the conservation value for species k (VS_k) is

$$VS_k = \frac{\left(a\frac{1/O_k}{\sum_{i=1}^{S} 1/O_i} + b\frac{1/\ln T_k}{\sum_{i=1}^{S} 1/\ln T_i} + c\frac{1/E_k}{\sum_{i=1}^{S} 1/E_i}\right)}{3} \times 100,$$

where S is the number of species considered, O_k is the total number of sampling sites where species k occurred in all samples, T_k is the total number of captured individuals of species k in all samples, E_k is the endemic value of species k according to its distribution range (the species with lowest value has the most restricted distribution), and a, b, and c are weighting factors that may vary according to the importance placed on conserving distribution (a), abundance (b), or endemicity (c).

Logistic regression modelling presence absence of species as a function of environmental covariates (e.g. river width, distance to sea, elevation, temperature, etc)