**Description of functions in “fresponse.r”**

First, source the file fresponse.r . Libraries bbmle, emdbook & MASS load automatically. These three libraries are required.

**Functions:**

Simulation functions

fr.sim.data

fr.sim.data.multi

Functional response functions

Type0

TypeI

TypeII

TypeIIIa

TypeIIIb

TypeII.h

TypeIIIa.h

TypeIIIb.h

multi.disc

multi.joly

Functional response likelihood functions

LL0

LL1

LL2

LL3a

LL3b

LL2.h

LL3a.h

LL3b.h

LLmulti.disc

LLmulti.disc2

LLmulti.disc2old

LLmulti.joly

Estimation functions

fr.fit

fr.fit.multi

fr.fit.n

fr.fit.out

pred.rate

switching

Plot functions

fr.plot.nls

fr.plot.mle

**SIMULATION FUNCTIONS**

**Name: fr.sim.data**

**Description:** Function for simulating data sets: generates prey density (x), calculates the deterministic part (y.hat), and adds error (normally distributed with zero mean and sd=sigma) to y.hat, rendering the response variable y. Parameterization is Michaelis-Menten.

**Usage:** fr.sim.data(parms, lims, sigma, n, sets, xmethod)

**Arguments:** parms = functional response parameters

lims = min and max x-values

sigma = error (rse)

n = number of values in each set

sets = generate "sets" number of data sets

xmethod = how to generate x-values:

full.x.range = draw n uniform values from min.x to max.x

even.x.range = split x-range into 4 bins (determined by the quantiles of min.x and max.x) , assign equal (or nearly equal if n isn't a multiple of 4) number of values in each bin.

**Details:** parms: must be a list with named objects. a = asymptote, c = exponent controlling shape of curve, b = half saturation constant

lims:a list with min and max x-values. Min and max limits must be called min.x and max.x. Can not handle other vectors than lists.

sigma: numeric, Error

n: numeric, numberof values in each data set

sets: numeric, generate “sets” number of data sets with n values in each set

xmethod: “full.x.range” draws n values from lims$min.x to lims$max.x. “even.x.range” divides x-range into groups by calculating quantiles from lims$min.x to lims$max.x. Add more

**Note/issues:** The response variable y is calculated as y = y.hat + norm(0, sigma). This can (and will often) result in negative estimates at low densities. I have instead of removing negative values changed them to absolute values. Might not be the best solution, as there might be too many positive residuals at low densities. Another option would be to remove negative values, but datasets would then be of unequal length.

**Name:**

**Description:**

**Usage:**

**Arguments:**

**Details:**

**Note/issues:**