

# Package ‘mosqcontrol’

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**Type** Package

**Title** Mosquito Control Resource Optimization

**Version** 0.1.0

**Description** This project aims to make an accessible model for mosquito control resource optimization. The model uses data provided by users to estimate the mosquito populations in the sampling area for the sampling time period, and the optimal time to apply a treatment or multiple treatments.

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**Encoding** UTF-8

**LazyData** true

**Suggests** knitr, rmarkdown, testthat

**VignetteBuilder** knitr

**RoxygenNote** 7.0.2

**Imports** magrittr, assertthat, pracma, NlcOptim, nloptr, sfsmisc

**NeedsCompilation** no

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**Repository** CRAN

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control

*Optimal Control***Description**

Creates optimal schedule of pulses for mosquito control.

**Usage**

```
control(
  counts,
  time,
  mu = 1/14,
  m = 3,
  n_lam = 25,
  kmax = 20,
  global_opt = 0,
  n_pulse = 4,
  rho = 0.3,
  days_between = 3,
  max_eval = 10000
)
```

**Arguments**

counts	Numeric vector of population counts.
time	Numeric vector with corresponding day of year measurments. Example: Jan 1st = day 1. Must be same length as counts.
mu	Numeric indicating natural population death rate.
m	Numeric indicating number of lifetimes for population decay between seasons
n_lam	Numeric max fourier mode order to calculate.
kmax	Numeric max number of dynamics fourier modes to use in calculating fourier sum (different than N_lam = max emergence fourier mode set by user for curve fitting portion of the code. Kmax should be an integer between 2 and 200, default at 20).
global_opt	Numeric set to 0 if user chooses local optimum, 1 if user chooses golbal GN_DIRECT_L_RAND method, 2 if user chooses global GN_ISRES method.
n_pulse	Numeric number of pulses, set by user, integer between 1 and 10.
rho	Numeric percent knockdown (user set between .01 and .30, e.g. 1% to 30% knockdown).
days_between	Numeric minimum number of days allowed between pulses set by user (integer bewtween 0 and 30 days).
max_eval	Numeric maximum evaluations for optimization step.

**Value**

Control list of control parameters.

**Examples**

```
y_in <- c(15, 40, 45, 88, 99, 145, 111, 132, 177, 97, 94, 145, 123, 111,
125, 115, 155, 160, 143, 132, 126, 125, 105, 98, 87, 54, 55, 8
)
t_in_user <- c(93, 100, 107, 114, 121, 128, 135, 142, 149, 163, 170, 177,
184, 191, 198, 205, 212, 219, 226, 233, 240, 247, 254, 261,
267, 274, 281, 288
)
control(y_in, t_in_user, global_opt = -1)
```

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mosqcontrol

*mosqcontrol: Mosquito Control Resource Optimization*

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**Description**

This project aims to make an accessible model for mosquito control resource optimization. The model uses data provided by users to estimate the mosquito populations in the sampling area for the sampling time period, and the optimal time to apply a treatment or multiple treatments.

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uperm

*uperm*

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**Description**

uperm returns permutation matrix.

**Usage**

uperm(d)

**Arguments**

d                    Vector

**Details**

For a given list of numbers, this function outputs a matrix, where each row is a unique permutation of the list.

**Examples**

```
uperm(c(1, 2))
```

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