

# 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

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**NeedsCompilation** no

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## Contents

|                       |          |
|-----------------------|----------|
| control . . . . .     | 2        |
| mosqcontrol . . . . . | 3        |
| uperm . . . . .       | 3        |
| <b>Index</b>          | <b>5</b> |

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.

**Author(s)**

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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))
```

# Index

control, [2](#)

mosqcontrol, [3](#)

mosqcontrol-package (mosqcontrol), [3](#)

uperm, [3](#)