Package ‘mosqcontrol’

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Version 0.1.0
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control  

**Optimal Control**

*Description*

Creates optimal schedule of pulses for mosquito control.

*Usage*

```r
c 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 measurements. 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 indicating number of lifetimes for population decay between seasons.
- `kmax` Numeric max fourier mode order to calculate.
- `global_opt` Numeric set to 0 if user chooses local optimum, 1 if user chooses global 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 between 0 and 30 days).
- `max_eval` Numeric maximum evaluations for optimization step.
Value

Control list of control parameters.

Examples

```r
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)
```

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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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

\(\text{uperm}(c(1, 2))\)
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