# Package 'optsize'

May 9, 2026

**Title** Optimal Plot Size Estimation for Field Experiments

**Version** 0.1.0

**Description** Provides methods for determining optimum plot size and shape in field experiments using Fairfield-Smith's variance law approach. It will evaluate field variability, determine optimum plot size and shape and study fertility trends across the field.

**License** GPL (>= 3)

**Encoding** UTF-8

**RoxygenNote** 7.3.3

**Imports** ggplot2

**Suggests** knitr, rmarkdown

**VignetteBuilder** knitr

**NeedsCompilation** no

**Author** Y.A. Garde [aut, cre, cph] (ORCID:
<https://orcid.org/0000-0002-0297-316X>),
S.G. Patil [aut],
M.S. Shitap [aut]

**Maintainer** Y.A. Garde <y.garde@yahoo.co.in>

**Repository** CRAN

**Date/Publication** 2025-10-06 08:30:02 UTC

## Contents

---

`compute_moving_avg` *Compute 3x3 moving averages*

---

## Description

Compute 3x3 moving averages

## Usage

```
compute_moving_avg(mat)
```

## Arguments

| | |
|---|---|
| `mat` | A numeric matrix (at least 3 rows and 3 columns) |

## Value

A numeric matrix of 3x3 moving averages

---

`ferti_analysis` *Fertility Classes heatmap with 3 * 3 moving average values —*

---

## Description

Fertility Classes heatmap with 3 * 3 moving average values —

## Usage

```
ferti_analysis(mat)
```

## Arguments

| | |
|---|---|
| `mat` | A matrix to be converted into a horizontal vector |

## Value

Heatmap

## fit_variance_law *Fit Fairfield-Smith's variance law to matrix data with ggplot2 plots*

### Description

This function fits the Fairfield-Smith variance law, computes weighted R^2 on the log-log scale, identifies the optimum plot size and recommended shape, and produces two ggplot2 visualisations (original and log scale).

### Usage

```
fit_variance_law(df_mat, plot_curve = TRUE)
```

### Arguments

| | |
|---|---|
| df_mat | numeric matrix of data |
| plot_curve | logical, if TRUE returns ggplot objects |

### Value

list with results:

- df_shapes: data.frame of plot shapes
- V1: variance at 1x1
- b_hat: estimated variance law coefficient
- R2_log: weighted R^2 on log-log scale
- x_opt: optimum plot size (units)
- Vx_opt: predicted variance at optimum
- best_shape: recommended shape for optimum plot size
- plots: list of ggplot objects if plot_curve = TRUE

## generate_plot_shapes *Generate valid plot sizes and shapes*

### Description

Generate valid plot sizes and shapes

### Usage

```
generate_plot_shapes(df_mat)
```

### Arguments

| | |
|---|---|
| df_mat | numeric matrix of data |

### Value

data.frame of possible plot sizes and shapes

---

## get_Tvals *Compute T values (sum of block totals) for a given h x w plot*

---

### Description

Compute T values (sum of block totals) for a given h x w plot

### Usage

```
get_Tvals(df_mat, h, w)
```

### Arguments

| | |
|---|---|
| df_mat | numeric matrix of data |
| h | rows in plot |
| w | cols in plot |

### Value

numeric vector of block totals

---

## make_horizontal *Make a horizontal vector from a matrix*

---

### Description

Creates a row-wise vector from a matrix. For every second row, the elements are reversed.

### Usage

```
make_horizontal(mat)
```

### Arguments

| | |
|---|---|
| mat | A matrix to be converted into a horizontal vector |

### Value

A numeric vector

## make_vertical *Make a vertical vector from a matrix*

### Description

Creates a column-wise vector from a matrix. For every second column, the elements are reversed.

### Usage

```
make_vertical(mat)
```

### Arguments

| | |
|---|---|
| mat | A matrix to be converted into a vertical vector |

### Value

A numeric vector

## population_variance *Compute population variance for given h x w plot*

### Description

Compute population variance for given h x w plot

### Usage

```
population_variance(df_mat, h, w)
```

### Arguments

| | |
|---|---|
| df_mat | numeric matrix of data |
| h | rows in plot |
| w | cols in plot |

### Value

numeric variance

## serial_corr *Compute first-order serial correlation of a vector*

### Description

Computes the correlation between consecutive elements of a numeric vector.

### Usage

```
serial_corr(vec)
```

### Arguments

| | |
|---|---|
| vec | A numeric vector |

### Value

Numeric value of the serial correlation

## serial_corrl *computes the first-order serial correlation for both directions.*

### Description

computes the first-order serial correlation for both directions.

### Usage

```
serial_corrl(df_mat)
```

### Arguments

| | |
|---|---|
| df_mat | A numeric matrix |

### Value

A named list with two elements:

- vertical: first-order serial correlation along vertical snake
- horizontal: first-order serial correlation along horizontal snake

# Index