Lansing dataset

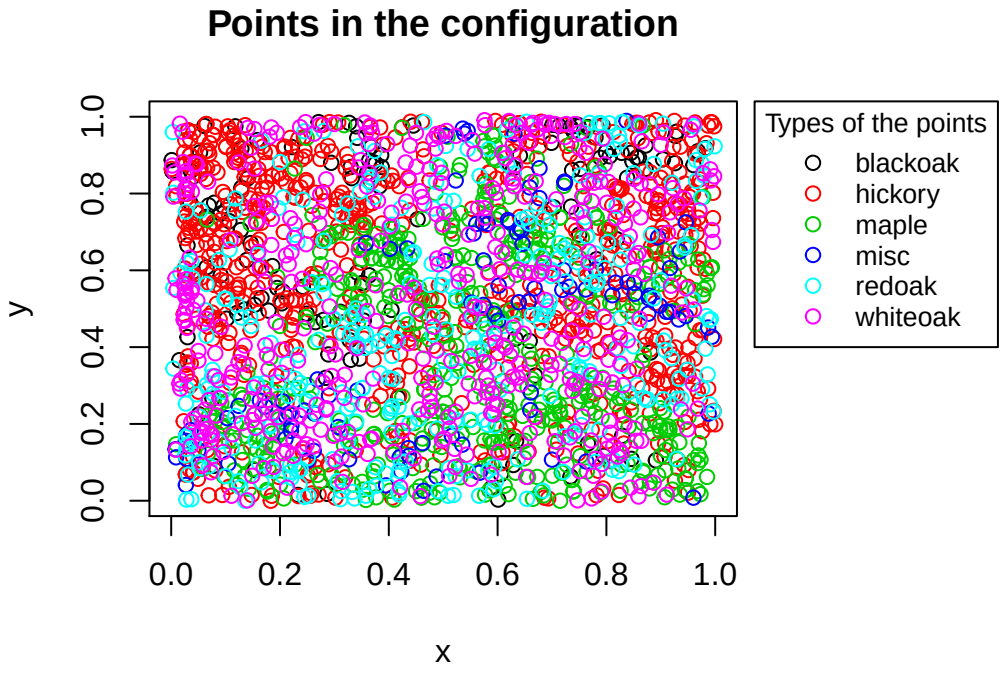
```
library(ppjsdm)
library(spatstat)
#> Loading required package: spatstat.data
#> Loading required package: nlme
#> Loading required package: rpart
#>
#> spatstat 1.63-0       (nickname: 'Space camouflage')
#> For an introduction to spatstat, type 'beginner'
remove(list = ls())

set.seed(1)
```

This vignette explains how to use the `ppjsdm` package with the Lansing dataset from `spatstat`. We begin by loading the data with all species.

```
data(lansing)
configuration <- as.Configuration(lansing)
window <- Rectangle_window(c(0, 1), c(0, 1))
```

The point configuration is plotted below.

```
par(mar = c(5, 4, 4, 13) + 0.1)
plot(configuration, window = window)
```



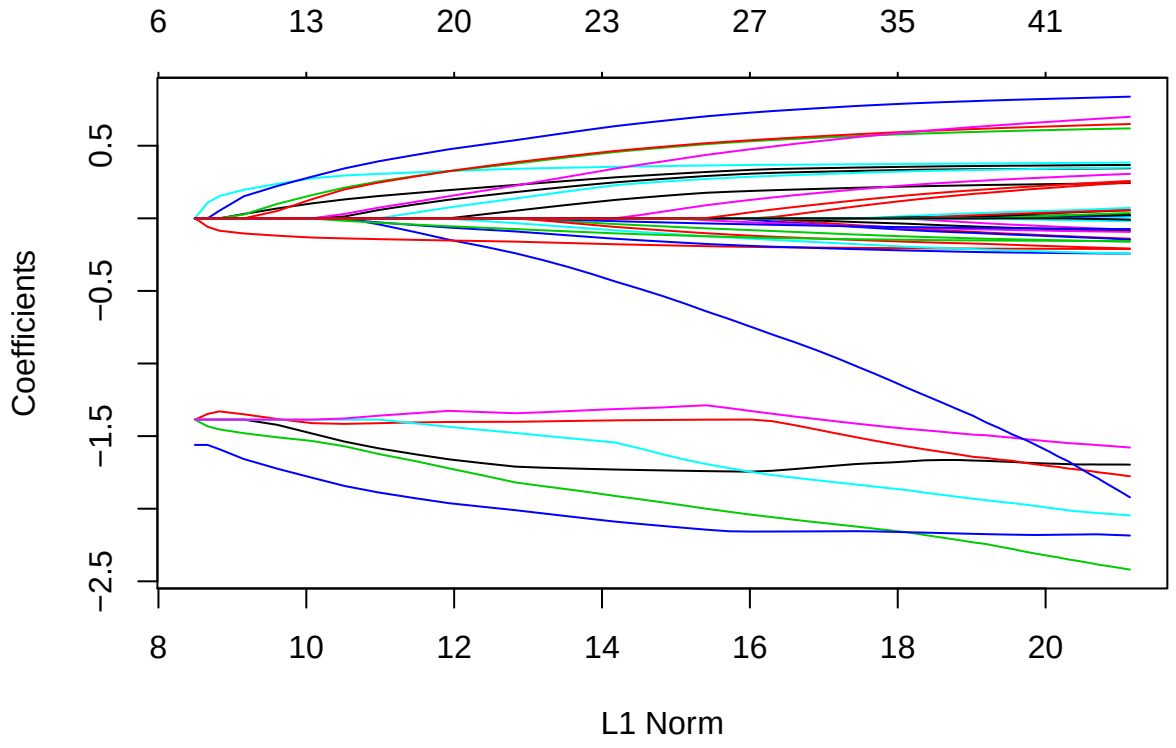
We fit the data with the Geyer model.

```
short_range <- matrix(0.025, 6, 6)
medium_range <- matrix(0.025, 6, 6)
long_range <- matrix(0.05, 6, 6)
model <- "Geyer"
medium_range_model <- "Geyer"
```

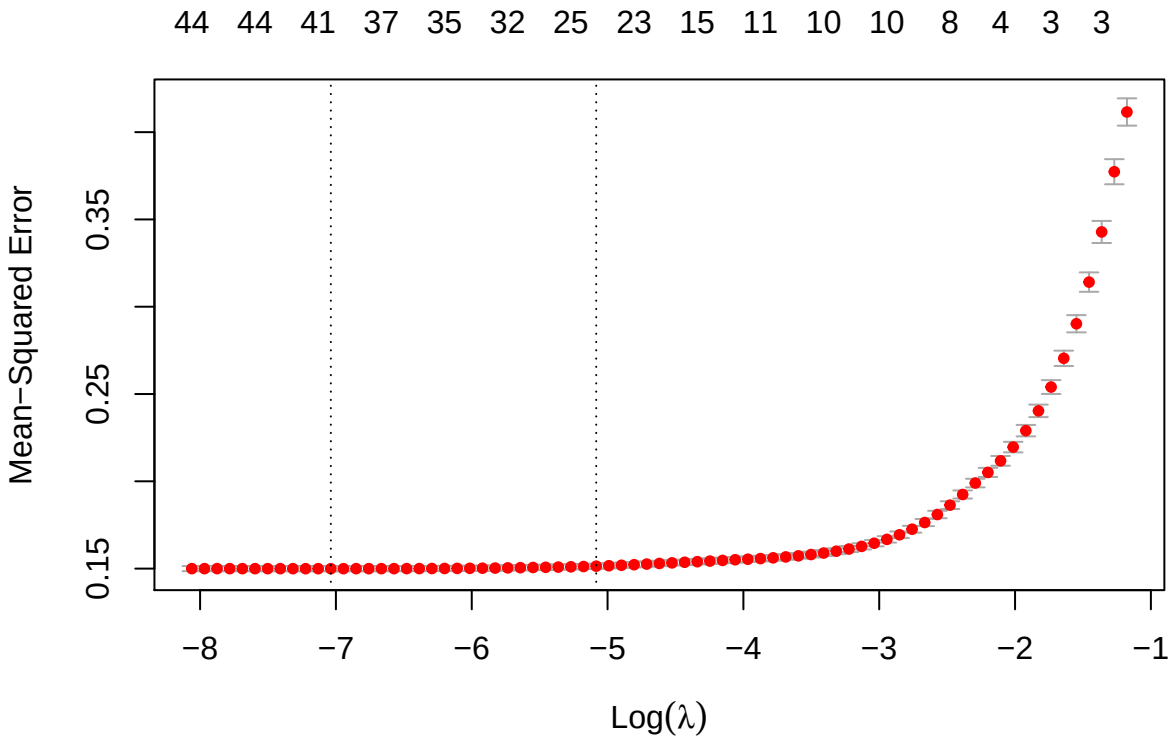
The matrix `radii` models interaction radii within a species, and between species.

```
fit <- ppjsdm::gibbsm(configuration,
                      window = window,
                      model = model,
                      medium_range_model = medium_range_model,
                      short_range = short_range,
                      medium_range = medium_range,
                      long_range = long_range,
                      use_glmnet = TRUE)
#> 49 x 1 sparse Matrix of class "dgCMatrix"
#>                          1
#> (Intercept)  .
#> log_lambda1  4.594860701
#> log_lambda2  6.165067104
#> log_lambda3  5.209539782
#> log_lambda4  4.029840952
#> log_lambda5  5.186792037
#> log_lambda6  5.912414051
#> alpha_1_1    0.344684137
#> alpha_1_2   -0.140493870
#> alpha_1_3   -0.160965231
#> alpha_1_4   -1.921730136
#> alpha_1_5    0.071648062
#> alpha_1_6   -0.078239152
#> alpha_2_2    0.367782037
#> alpha_2_3   -0.211072356
#> alpha_2_4   -0.016897639
#> alpha_2_5    .
#> alpha_2_6   -0.243526856
#> alpha_3_3    0.383944791
#> alpha_3_4    0.016747371
#> alpha_3_5   -0.088382388
#> alpha_3_6   -0.208001646
#> alpha_4_4    0.619298199
#> alpha_4_5    .
#> alpha_4_6   -0.145923477
#> alpha_5_5    0.348927654
#> alpha_5_6   -0.093360026
#> alpha_6_6    0.242937718
#> gamma_1_1    0.649430080
#> gamma_1_2    0.024992528
#> gamma_1_3   -0.074300875
#> gamma_1_4   -0.244039080
#> gamma_1_5   -0.011932122
#> gamma_1_6    0.055810610
#> gamma_2_2    0.247859570
```

```
#> gamma_2_3   -0.157051029
#> gamma_2_4    .
#> gamma_2_5    0.017420334
#> gamma_2_6   -0.019367371
#> gamma_3_3    0.698891870
#> gamma_3_4    0.023727189
#> gamma_3_5    0.056140847
#> gamma_3_6    0.036093602
#> gamma_4_4    0.837885988
#> gamma_4_5    .
#> gamma_4_6    0.007489306
#> gamma_5_5    0.306126583
#> gamma_5_6   -0.009291041
#> gamma_6_6    0.257142593
plot(fit$complete)
```




```
plot(fit$cv)
```




```
print(fit$coefficients)
#> 49 x 1 sparse Matrix of class "dgCMatrix"
#>                          1
#> (Intercept)  .
#> log_lambda1  4.594860701
#> log_lambda2  6.165067104
#> log_lambda3  5.209539782
#> log_lambda4  4.029840952
#> log_lambda5  5.186792037
#> log_lambda6  5.912414051
#> alpha_1_1    0.344684137
#> alpha_1_2   -0.140493870
#> alpha_1_3   -0.160965231
#> alpha_1_4   -1.921730136
#> alpha_1_5    0.071648062
#> alpha_1_6   -0.078239152
#> alpha_2_2    0.367782037
#> alpha_2_3   -0.211072356
#> alpha_2_4   -0.016897639
#> alpha_2_5    .
#> alpha_2_6   -0.243526856
#> alpha_3_3    0.383944791
#> alpha_3_4    0.016747371
#> alpha_3_5   -0.088382388
#> alpha_3_6   -0.208001646
#> alpha_4_4    0.619298199
```

```
#> alpha_4_5    .
#> alpha_4_6   -0.145923477
#> alpha_5_5    0.348927654
#> alpha_5_6   -0.093360026
#> alpha_6_6    0.242937718
#> gamma_1_1    0.649430080
#> gamma_1_2    0.024992528
#> gamma_1_3   -0.074300875
#> gamma_1_4   -0.244039080
#> gamma_1_5   -0.011932122
#> gamma_1_6    0.055810610
#> gamma_2_2    0.247859570
#> gamma_2_3   -0.157051029
#> gamma_2_4    .
#> gamma_2_5    0.017420334
#> gamma_2_6   -0.019367371
#> gamma_3_3    0.698891870
#> gamma_3_4    0.023727189
#> gamma_3_5    0.056140847
#> gamma_3_6    0.036093602
#> gamma_4_4    0.837885988
#> gamma_4_5    .
#> gamma_4_6    0.007489306
#> gamma_5_5    0.306126583
#> gamma_5_6   -0.009291041
#> gamma_6_6    0.257142593
```