Datasets provided for spatstat

Adrian Baddeley, Rolf Turner and Ege Rubak

For spatstat version 2.3-3

This document is an overview of the spatial datasets that are provided for the spatstat package.

To flick through a nice display of all the data sets that come with spatstat type demo(data). To see information about a given data set, type help(name) where name is the name of the data set. To plot a given data set, type plot(name).

Datasets in spatstat are “lazy-loaded”, which means that they can be accessed simply by typing their name. Not all packages do this; in some packages you have to type data(name) in order to access a data set.

To list all the datasets in spatstat, you need to type data(package="spatstat.data"). This is because, for efficiency, the datasets are actually installed in a sub-package spatstat.data. This is the only time you should ever need to mention spatstat.data explicitly. When the spatstat package is loaded by the command library(spatstat), the sub-package spatstat.data is automatically loaded.

1 List of datasets

1.1 Point patterns in 2D

Here is a list of the standard point pattern data sets that are supplied with the current installation of spatstat.data:
<table>
<thead>
<tr>
<th>name</th>
<th>description</th>
<th>marks</th>
<th>covariates</th>
<th>window</th>
</tr>
</thead>
<tbody>
<tr>
<td>amacrine</td>
<td>rabbit amacrine cells</td>
<td>cell type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>anemones</td>
<td>sea anemones</td>
<td>diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ants</td>
<td>ant nests</td>
<td>species</td>
<td>zones</td>
<td></td>
</tr>
<tr>
<td>bdspots</td>
<td>breakdown spots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bei</td>
<td>rainforest trees</td>
<td></td>
<td>topography</td>
<td></td>
</tr>
<tr>
<td>betacells</td>
<td>cat retinal ganglia</td>
<td>cell type, area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bramblecanes</td>
<td>bramble canes</td>
<td>age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bronzefilter</td>
<td>bronze particles</td>
<td>diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>btb</td>
<td>bovine tuberculosis</td>
<td>type, year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cells</td>
<td>biological cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chorley</td>
<td>cancers</td>
<td>case/control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>clmfires</td>
<td>forest fires</td>
<td>cause, size, date</td>
<td>slope, land use</td>
<td></td>
</tr>
<tr>
<td>concrete</td>
<td>air bubbles in concrete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>copper</td>
<td>copper deposits</td>
<td></td>
<td>fault lines</td>
<td></td>
</tr>
<tr>
<td>demopat</td>
<td>artificial data</td>
<td>type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>finpines</td>
<td>trees</td>
<td>diam, height</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gordon</td>
<td>people in a park</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gorillas</td>
<td>gorilla nest sites</td>
<td>group, season</td>
<td>heat, water</td>
<td></td>
</tr>
<tr>
<td>hamster</td>
<td>hamster tumour cells</td>
<td>cell type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>humberside</td>
<td>child leukaemia</td>
<td>case/control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hyyttala</td>
<td>mixed forest</td>
<td>species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>japonesepines</td>
<td>Japanese pines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lansing</td>
<td>mixed forest</td>
<td>species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>longleaf</td>
<td>trees</td>
<td>diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mucosa</td>
<td>gastric mucosa cells</td>
<td>cell type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>murchison</td>
<td>gold deposits</td>
<td></td>
<td>faults, rock type</td>
<td></td>
</tr>
<tr>
<td>nbfires</td>
<td>wildfires</td>
<td>several</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nztrees</td>
<td>trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>paracou</td>
<td>trees</td>
<td>adult/juvenile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ponderosa</td>
<td>trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>redwood</td>
<td>saplings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>redwood3</td>
<td>saplings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>redwoodfull</td>
<td>saplings</td>
<td></td>
<td>zones</td>
<td></td>
</tr>
<tr>
<td>shapley</td>
<td>galaxies</td>
<td>magnitude, recession, SE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>simdat</td>
<td>simulated pattern</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sporophores</td>
<td>fungi</td>
<td>species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>spruces</td>
<td>trees</td>
<td>diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>swedishpines</td>
<td>trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urkiola</td>
<td>mixed forest</td>
<td>species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vesicles</td>
<td>synaptic vesicles</td>
<td></td>
<td>zones</td>
<td></td>
</tr>
<tr>
<td>waka</td>
<td>trees</td>
<td>diameter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The shape of the window containing the point pattern is indicated by the symbols [rectangle], ○ (disc), □ (convex polygon), [irregular polygon) and [binary mask).

Additional information about the data set name may be stored in a separate list name.extra.
Currently these are the available options:

<table>
<thead>
<tr>
<th>NAME</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ants.extra</td>
<td>field and scrub subregions; additional map elements; plotting function</td>
</tr>
<tr>
<td>bei.extra</td>
<td>covariate images</td>
</tr>
<tr>
<td>chorley.extra</td>
<td>incinerator location; plotting function</td>
</tr>
<tr>
<td>gorillas.extra</td>
<td>covariate images</td>
</tr>
<tr>
<td>nbfires.extra</td>
<td>inscribed rectangle; border type labels</td>
</tr>
<tr>
<td>ponderosa.extra</td>
<td>data points of interest; plotting function</td>
</tr>
<tr>
<td>redwoodfull.extra</td>
<td>subregions; plotting function</td>
</tr>
<tr>
<td>shapley.extra</td>
<td>individual survey fields; plotting function</td>
</tr>
<tr>
<td>vesicles.extra</td>
<td>anatomical regions</td>
</tr>
</tbody>
</table>

For demonstration and instruction purposes, raw data files are available for the datasets vesicles, gorillas and osteo.

1.2 Other Data Types

There are also the following spatial data sets which are not 2D point patterns:

<table>
<thead>
<tr>
<th>name</th>
<th>description</th>
<th>format</th>
</tr>
</thead>
<tbody>
<tr>
<td>austates</td>
<td>Australian states</td>
<td>tessellation</td>
</tr>
<tr>
<td>cetaceans</td>
<td>marine survey</td>
<td>replicated 2D point patterns</td>
</tr>
<tr>
<td>chicago</td>
<td>crimes</td>
<td>point pattern on linear network</td>
</tr>
<tr>
<td>demohyper</td>
<td>simulated data</td>
<td>replicated 2D point patterns with covariates</td>
</tr>
<tr>
<td>dendrite</td>
<td>dendritic spines</td>
<td>point pattern on linear network</td>
</tr>
<tr>
<td>flu</td>
<td>virus proteins</td>
<td>replicated 2D point patterns</td>
</tr>
<tr>
<td>heather</td>
<td>heather mosaic</td>
<td>binary image (three versions)</td>
</tr>
<tr>
<td>osteo</td>
<td>osteocyte lacunae</td>
<td>replicated 3D point patterns with covariates</td>
</tr>
<tr>
<td>pyramidal</td>
<td>pyramidal neurons</td>
<td>replicated 2D point patterns in 3 groups</td>
</tr>
<tr>
<td>residualspaper</td>
<td>data &amp; code from Baddeley et al (2005)</td>
<td>2D point patterns, R function</td>
</tr>
<tr>
<td>simba</td>
<td>simulated data</td>
<td>replicated 2D point patterns in 2 groups</td>
</tr>
<tr>
<td>spiders</td>
<td>spider webs</td>
<td>point pattern on linear network</td>
</tr>
<tr>
<td>waterstriders</td>
<td>insects on water</td>
<td>replicated 2D point patterns</td>
</tr>
</tbody>
</table>

Additionally there is a dataset Kovesi containing several colour maps with perceptually uniform contrast.

2 Information on each dataset

Here we give basic information about each dataset. For further information, consult the help file for the particular dataset.

**amacrine:** Amacrine cells

Locations of displaced amacrine cells in the retina of a rabbit. There are two types of points, “on” and “off”.

> plot(amacrine)
anemones: Sea Anemones

These data give the spatial locations and diameters of sea anemones on a boulder near sea level.

> plot(anemones, markscale=1)

ants: Ants’ nests

Spatial locations of nests of two species of ants at a site in Greece. The full dataset (supplied here) has an irregular polygonal boundary, while most analyses have been confined to two rectangular subsets of the pattern (also supplied here).

> ants.extra$plotit()
austates: Australian states

The states and large mainland territories of Australia are represented as polygonal regions forming a tessellation.

```r
> plot(austates)
```

bdspots: Breakdown spots

A list of three point patterns, each giving the locations of electrical breakdown spots on a circular electrode in a microelectronic capacitor.

```r
> plot(bdspots, equal.scales=TRUE, pch="*",
+       panel.args=function(i)list(cex=c(0.15, 0.2, 0.7)[i]))
```
bei: Beilschmiedia data

Locations of 3605 trees in a tropical rain forest. Accompanied by covariate data giving the elevation (altitude) and slope of elevation in the study region.

> plot(bei.extra$elev, main="Beilschmiedia")
> plot(bei, add=TRUE, pch=16, cex=0.3)

The following command gives a perspective display similar to the front cover of Baddeley, Rubak and Turner (2015):

> M <- persp(bei.extra$elev,
>     theta=-45, phi=18, expand=7,
>     border=NA, apron=TRUE, shade=0.3,
>     box=FALSE, visible=TRUE,
>     main="")
> perspPoints(bei, Z=bei.extra$elev, M=M, pch=16, cex=0.3)
betacells: Beta ganglion cells

Locations of beta ganglion cells in cat retina, each cell classified as ‘on’ or ‘off’ and also labelled with the cell profile area.

> plot(betacells)

bramblecanes: Bramble canes

> plot(bramblecanes, cols=1:3)

Try the following

> plot(split(bramblecanes))

bronzefilter: Bronze filter section profiles

Spatially inhomogeneous pattern of circular section profiles of particles, observed in a longitudinal plane section through a gradient sinter filter made from bronze powder.

> plot(bronzefilter, markscale=2)
**btb: bovine tuberculosis**

Locations of farms where bovine tuberculosis was detected, marked by year of detection and spoligotype of tuberculosis.

```r
> plot(btb, which.marks="spoligotype", cols=2:5, chars=1:4)
```

**cells: Biological cells**

Locations of the centres of 42 biological cells observed under optical microscopy in a histological section. Often used as a demonstration example.

```r
> plot(cells)
```
cetaceans: Survey of marine species
Recorded sightings of whales, dolphins and other marine species in a series of surveys. Replicated 2D marked point patterns.

> plot(cetaceans.extra$patterns, main="Cetaceans data", cols=1:5, hsep=1)

chicago: Chicago crimes
Locations (street addresses) of crimes reported in a two-week period in an area close to the University of Chicago. A multitype point pattern on a linear network.

> plot(chicago, main="Chicago Crimes", col="grey",
+       cols=c("red", "blue", "black", "blue", "red", "blue", "blue"),
+       chars=c(16,2,22,17,24,15,6), leg.side="left", show.window=FALSE)
chorley: Chorley-Ribble cancer data

Spatial locations of cases of cancer of the larynx and cancer of the lung, and the location of a disused industrial incinerator. A marked point pattern, with an irregular window and a simple covariate.

> chorley.extra$plotit()

clmfires: Castilla-La Mancha Fires

Forest fires in the Castilla-La Mancha region of Spain between 1998 and 2007. A point pattern with 4 columns of marks:

- cause: cause of fire
- burnt.area: total area burned, in hectares
- date: date of fire
- julian.date: date of fire in days since 1.1.1998

> plot(clmfires, which.marks="cause", cols=2:5, cex=0.25,
+     main="Castilla-La Mancha forest fires")
The accompanying dataset `clmfires.extra` is a list of two items `clmcov100` and `clmcov200` containing covariate information for the entire Castilla-La Mancha region. Each of these two elements is a list of four pixel images named `elevation`, `orientation`, `slope` and `landuse`.

```r
> plot(clmfires.extra$clmcov100$elevation, main="Elevation")
```

**concrete: Air bubbles in concrete**

Prof. Shin-ichi Igarashi’s data: a point pattern of the locations of centroids of air bubbles seen in a cross-section of concrete. Air bubbles are present in the matrix of cement paste which surrounds the particles of aggregate. The outline of the aggregate, and the locations of the centroids of the bubble profiles, are recorded.

```r
> plot(concrete, chars="+", cols="blue", col="yellow")
```
**copper: Queensland copper data**

These data come from an intensive geological survey in central Queensland, Australia. They consist of 67 points representing copper ore deposits, and 146 line segments representing geological ‘lineaments’, mostly faults.

```r
> plot(copper$Points, main="Copper")
> plot(copper$Lines, add=TRUE)
```

**demohyper**

A synthetic example of a hyperframe for demonstration purposes.

```r
> plot(demohyper, quote({ plot(Image, main=""); plot(Points, add=TRUE) }),
+     parargs=list(mar=rep(1,4)))
```
demohyper

A synthetic example of a point pattern for demonstration purposes.

> plot(demopat)

dendrite

Dendrites are branching filaments which extend from the main body of a neuron (nerve cell) to propagate electrochemical signals. Spines are small protrusions on the dendrites.

This dataset gives the locations of 566 spines observed on one branch of the dendritic tree of a rat neuron. The spines are classified according to their shape into three types: mushroom, stubby or thin.

> plot(dendrite, leg.side="bottom", main="", cex=0.75, cols=2:4)
**finpines:** Finnish pine saplings

Locations of 126 pine saplings in a Finnish forest, their heights and their diameters.

```r
> plot(finpines, main="Finnish pines")
```

**flu:** Influenza virus proteins

The `flu` dataset contains replicated spatial point patterns giving the locations of two different virus proteins on the membranes of cells infected with influenza virus.

It is a hyperframe containing point patterns and explanatory variables.

```r
> wildM1 <- with(flu, virustype == "wt" & stain == "M2-M1")
> plot(flu[wildM1, 1, drop=TRUE],
+     main=c("flu data", "wild type virus, M2-M1 stain"),
+     chars=c(16,3), cex=0.4, cols=2:3)
```
gordon: People in Gordon Square

Locations of people sitting on a grass patch on a sunny afternoon.

> plot(gordon, main="People in Gordon Square", pch=16)

gorillas: Gorilla nesting sites

Locations of nesting sites of gorillas, and associated covariates, in a National Park in Cameroon.

gorillas is a marked point pattern (object of class "ppp") representing nest site locations.
gorillas.extra is a named list of 7 pixel images (objects of class "im") containing spatial covariates. It also belongs to the class "listof".

> plot(gorillas, which.marks=1, chars=c(1,3), cols=2:3, main="Gorilla nest sites")
The vegetation covariate is also available as a raw ASCII format file,

```r
> system.file("rawdata/gorillas/vegetation.asc", package="spatstat")
```

**hamster:** Hamster kidney cells

Cell nuclei in hamster kidney, each nucleus classified as either ‘dividing’ or ‘pyknotic’. A multitype point pattern.

```r
> plot(hamster, cols=c(2,4))
```

**heather:** Heather mosaic

The spatial mosaic of vegetation of the heather plant, recorded in a 10 by 20 metre sampling plot in Sweden. A list with three entries, representing the same data at different spatial resolutions.

```r
> plot(heather$coarse)
```
Type the following to see all three images:

> plot(heather)

**humberside: Childhood Leukemia and Lymphoma**

Spatial locations of cases of childhood leukaemia and lymphoma, and randomly-selected controls, in North Humberside. A marked point pattern.

> plot(humberside)

The dataset `humberside.convex` is an object of the same format, representing the same point pattern data, but contained in a larger, 5-sided convex polygon.

**hyytiala: Mixed forest**

Spatial locations and species classification for trees in a Finnish forest.

> plot(hyytiala, cols=2:5)
japanesepines: Japanese black pine saplings

Locations of Japanese black pine saplings in a square sampling region in a natural forest. Often used as a standard example.

```r
> plot(japanesepines)
```

lansing: Lansing Woods

Locations and botanical classification of trees in a forest. A multitype point pattern with 6 different types of points. Includes duplicated points.

```r
> plot(lansing)
```
Type the following to see 6 plots, each showing the location of one of the types of points:

```r
> plot(split(lansing))
```

**longleaf: Longleaf Pines**

Locations and diameters of Longleaf pine trees.

```r
> plot(longleaf)
```

**mucosa: Gastric Mucosa Cells**

A bivariate inhomogeneous point pattern, giving the locations of the centres of two types of cells in a cross-section of the gastric mucosa of a rat.

```r
> plot(mucosa, chars=c(1,3), cols=c("red", "green"))
> plot(mucosa.subwin, add=TRUE, lty=3)
```
murchison: Murchison Gold Deposits

Spatial locations of gold deposits and associated geological features in the Murchison area of Western Australia. A list of three elements:

- **gold**, the point pattern of gold deposits;
- **faults**, the line segment pattern of geological faults;
- **greenstone**, the subregion of greenstone outcrop.

Type the following to see the full Murchison dataset:

```r
> plot(murchison$greenstone, main="Murchison data", col="lightgreen")
> plot(murchison$gold, add=TRUE, pch=3, col="blue")
> plot(murchison$faults, add=TRUE, col="red")
```

Some analysis of the data uses a rectangle close to the abandoned town of Reedy:

```r
> reedy <- owin(c(580, 650), c(6986, 7026))
```

Here are the data in that area:
Murchison data

nbfires: New Brunswick Fires

Fires in New Brunswick (Canada) with marks giving information about each fire.

> plot(nbfires, use.marks=FALSE, pch=".")

The following command would show the data for each year in a separate panel:

> plot(split(nbfires), use.marks=FALSE, chars=".")
nztrees: New Zealand Trees

Locations of trees in a forest plot in New Zealand. Often used as a demonstration example.

```r
> plot(nztrees)
> plot(trim.rectangle(as.owin(nztrees), c(0,5), 0), add=TRUE, lty=3)
```

osteo: Osteocyte Lacunae

Replicated three-dimensional point patterns: the three-dimensional locations of osteocyte lacunae observed in rectangular volumes of solid bone using a confocal microscope. A hyperframe containing 3D point patterns and explanatory variables.

```r
> plot(osteo[1:4,], main.panel="", pch=21, bg='white')
```
For demonstration and instruction purposes, the raw data from the 36th point pattern are available in a plain ascii file in the `spatstat` installation,

```r
> system.file("rawdata/osteo/osteo36.txt", package="spatstat")
```

**paracou: Kimboto trees**

Point pattern of adult and juvenile Kimboto trees recorded at Paracou in French Guiana. A bivariate point pattern.

```r
> plot(paracou, cols=2:3, chars=c(16,3))
```

**ponderosa: Ponderosa Pines**

Locations of Ponderosa Pine trees in a forest. Several special points are identified.

```r
> ponderosa.extra$plotit()
```
**pyramidal**: **Pyramidal Neurons in Brain**

Locations of pyramidal neurons in sections of human brain. There is one point pattern from each of 31 human subjects. The subjects are divided into three groups: controls (12 subjects), schizoaffective (9 subjects) and schizophrenic (10 subjects).

To reduce space, we show only the odd-numbered patterns:

```r
> pyr <- pyramidal[c(FALSE,TRUE), ]
> pyr$grp <- abbreviate(pyr$group, minlength=7)
> plot(pyr, quote(plot(Neurons, pch=16, main=grp)), main="Pyramidal Neurons")
```

---

**redwood, redwood3, redwoodfull**: **Redwood seedlings and saplings**

California Redwood seedlings and saplings in a forest. There are two versions of this dataset: redwood and redwoodfull.

The redwoodfull dataset is the full data. It is spatially inhomogeneous in density and spacing of points.

The redwood dataset is a subset of the full data, selected because it is apparently homogeneous, and has often been used as a demonstration example. This comes in two versions commonly used in
the literature: \texttt{redwood} (coordinates given to 2 decimal places) and \texttt{redwood3} (coordinates given to 3 decimal places).

\begin{verbatim}
> plot(redwood)
> plot(redwood3, add=TRUE, pch=20)
\end{verbatim}

\begin{verbatim}
> redwoodfull.extra$plotit()
\end{verbatim}

\begin{verbatim}
> plot(as.solist(residualspaper[c("Fig1", "Fig4a", "Fig4b", "Fig4c")]),
        + main="")
\end{verbatim}

\textbf{residualspaper: Data from residuals paper}

Contains the point patterns used as examples in


along with R code.
**shapley: Shapley Galaxy Concentration**

Sky positions of 4215 galaxies in the Shapley Supercluster (mapped by radioastronomy).

```r
> shapley.extra$plotit(main="Shapley")
```

**simdat: Simulated data**

Another simulated dataset used for demonstration purposes.

```r
> plot(simdat)
```
spiders: Spider webs
Spider webs across the mortar lines of a brick wall. A point pattern on a linear network.

```r
> plot(spiders, pch=16, show.window=FALSE)
```

sporophores: Sporophores
Sporophores of three species of fungi around a tree.

```r
> plot(sporophores, chars=c(16,1,2), cex=0.6)
> points(0,0,pch=16, cex=2)
> text(15,8,"Tree", cex=0.75)
```
spruces: Spruces in Saxony
Locations of Norwegian spruce trees in a natural forest stand in Saxonia, Germany. Each tree is marked with its diameter at breast height.

```r
> plot(spruces, maxsize=min(nndist(spruces)))
```

**spruces**

swedishpines: Swedish Pines
Locations of pine saplings in a Swedish forest. Often used as a demonstration example.

```r
> plot(swedishpines)
```
**urkiola: trees in a wood**

Locations of birch and oak trees in a secondary wood in Urkiola Natural Park (Basque country, northern Spain). Irregular window, bivariate point pattern.

```r
> plot(urkiola, cex=0.5, cols=2:3)
```

**waka: trees in Waka National Park**

Spatial coordinates of each tree, marked by the tree diameter at breast height.

```r
> par(mar=c(0,0,2,0))
> plot(waka, markscale=0.04, main=c("Waka national park", "tree diameters"))
```
vesicles: synaptic vesicles

Point pattern of synaptic vesicles observed in rat brain tissue.

> v <- rotate(vesicles, pi/2)
> ve <- lapply(vesicles.extra, rotate, pi/2)
> plot(v, main="Vesicles")
> plot(ve$activezone, add=TRUE, lwd=3)

The auxiliary dataset `vesicles.extra` is a list with entries:
- **presynapse**: outer polygonal boundary of presynapse
- **mitochondria**: polygonal boundary of mitochondria
- **mask**: binary mask representation of vesicles window
- **activezone**: line segment pattern representing the active zone.

For demonstration and training purposes, the raw data files for this dataset are also provided in the `spatstat` package installation:
vesicles.txt  spatial locations of vesicles
presynapse.txt  vertices of presynapse
mitochondria.txt  vertices of mitochondria
vesiclesimage.tif  greyscale microscope image
vesiclesmask.tif  binary image of mask
activezone.txt  coordinates of activezone

The files are in the folder rawdata/vesicles in the spatstat installation directory. The precise location of the files can be obtained using system.file, for example

> system.file("rawdata/vesicles/mitochondria.txt", package="spatstat")

**waterstriders: Insects on a pond**

Three independent replications of a point pattern formed by insects on the surface of a pond.

> plot(waterstriders)