Interactive heatmaps in R with *d3heatmap* and *plotly*

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Wednesday October 21st, 2015
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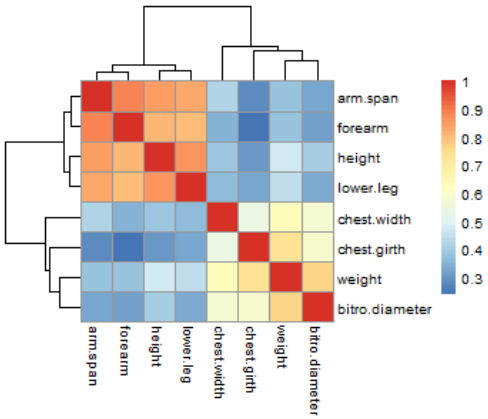
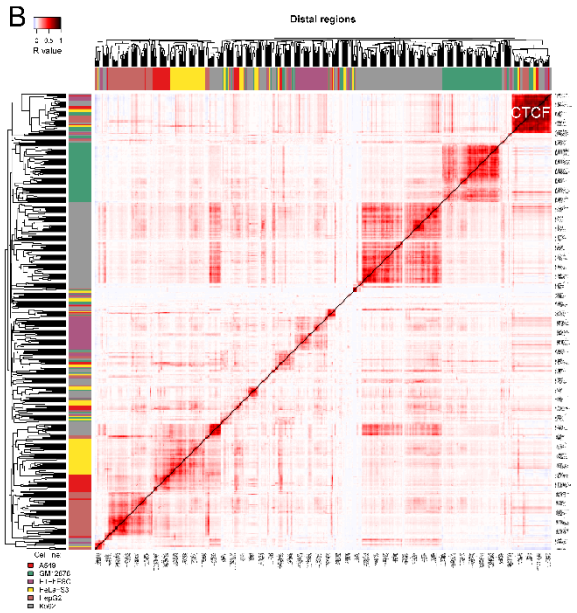
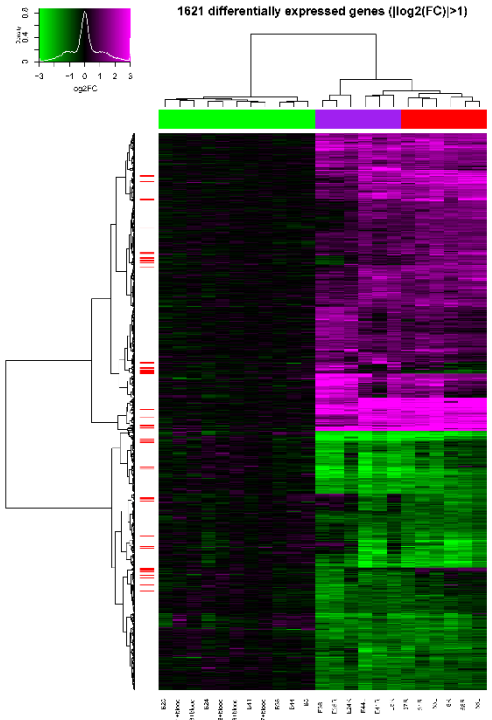
Heatmaps are:

- 2D, colour-coded, visualisations of numeric matrix
- Usually done with *heatmap()*, *heatmap.2()*, *pheatmap()* or *image()*
- Super-useful to display big datasets
- Can somehow be achieved by ggplot2, but no one does that.







Example datasets:

```
data("Harman23.cor")
```

Description

A correlation matrix of eight physical measurements on 305 girls between ages seven and seventeen.

```
data("volcano")
```

Description

Maunga Whau (Mt Eden) is one of about 50 volcanos in the Auckland volcanic field. This data set gives topographic information for Maunga Whau on a 10m by 10m grid.

Heatmap with d3heatmap

- CRAN package by Rstudio
- Is an *htmlwidget*
- Inspired by *heatmap()* and *heatmap.2()*

```
install.packages("d3heatmap")

d3heatmap(Harman23.cor$cov)

d3heatmap(volcano,
          Rowv = FALSE,
          Colv = FALSE,
          dendrogram = "none",
          colors = topo.colors(50)
)
```

Link 1!

Link 2!

Heatmap with d3heatmap

- Freeze browsers with large heatmap (500 x 500)
- How to save as a .html object with script?
- No “breaks” parameter
- No built-in colour legend
- *Shiny* compatible!

Heatmap with plotly

- Canadian private company: https://plot.ly/
- API with everything: Python, R, Excel, Matlab, Julia, Igor Pro, Spotfire, Javascript, Node.js, Ruby, GO, F#, Arduino, Raspberry + write your own API
- Free to use, but requires registration
- Automatically upload and host your plots on *plotly* website (unless used in *Shiny*)
- Many different kinds of plots

Heatmap with d3heatmap

```
install.packages("viridis")
install.packages("devtools")
devtools::install_github("ropensci/plotly")

Sys.setenv("plotly_username" = "your_plotly_username")
Sys.setenv("plotly_api_key" = "your_api_key")
```

```
plot_ly(z = Harman23.cor$cov,
        x = colnames(Harman23.cor$cov),
        y = rownames(Harman23.cor$cov),
        colorscale = list(
            c(0, "rgb(255,255,255)"),
            c(1, "rgb(255,0,0)")
        ),
        zmin = 0,
        zmax = 1,
        type = "heatmap"
)
# Success! Created a new plotly here ->
https://plot.ly/~gdevailly/118
```

Link 3!

Heatmap with plotly

- Unfriendly syntax
- No built-in clustering
- Built-in colour legend
- *Shiny* compatible!

Performance test on big matrices:

Link 4!

(source code)

d3heatmap

- R-friendly syntax
- In development

- R-**un**friendly syntax

Alternative:

rCharts highcharts Link 5!

- Even less friendly than plotly
- Slower with big dataset
- No registration
- Export a standalone *.html* page with script!