

Cinquièmes Rencontres R



Toulouse  
du 22 au 24 juin 2016



# Lightning talks

**Améliorer la qualité de son package R avec  
l'intégration continue**

*Géraud DUGE de BERNONVILLE, Valtech*

# Intégration continue avec R

*Ou comment améliorer la qualité de son package ?*

Géraud Dugé de Bernonville

@geraudster

# Qualité ?

THIS LOOKS LIKE THE OUTPUT OF A MARKOV BOT THAT'S BEEN FED BUS TIMETABLES FROM A CITY WHERE THE BUSES CRASH CONSTANTLY.



<< Chez Moi Ça Marche ! >>

A close-up, high-contrast photograph of two interlocking metal gears. The lighting highlights the metallic texture and the sharp, dark interlocking teeth. The background is dark and out of focus.

Intégration continue

1

# Référentiel de source Commun



cvs

2

# Tests

Exécutables

Automatisés

Dans le référentiel de source

devtools  
+  
testthat

# 3

# Construction régulière

et automatisée

Analyse de code

Tests

Packaging

Rapport

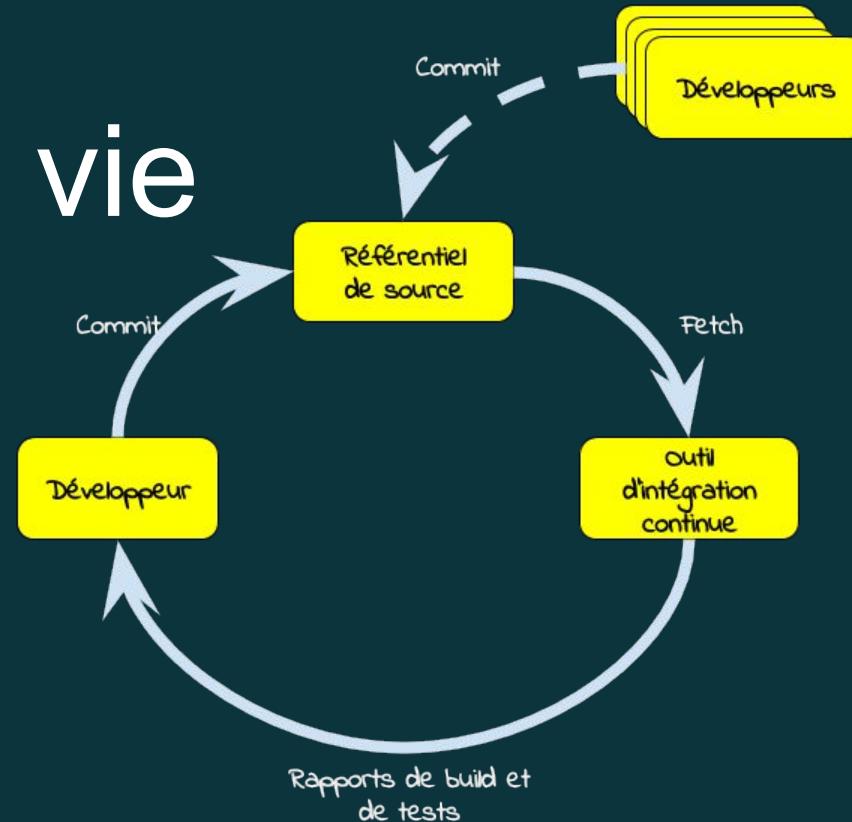


Travis CI



Jenkins

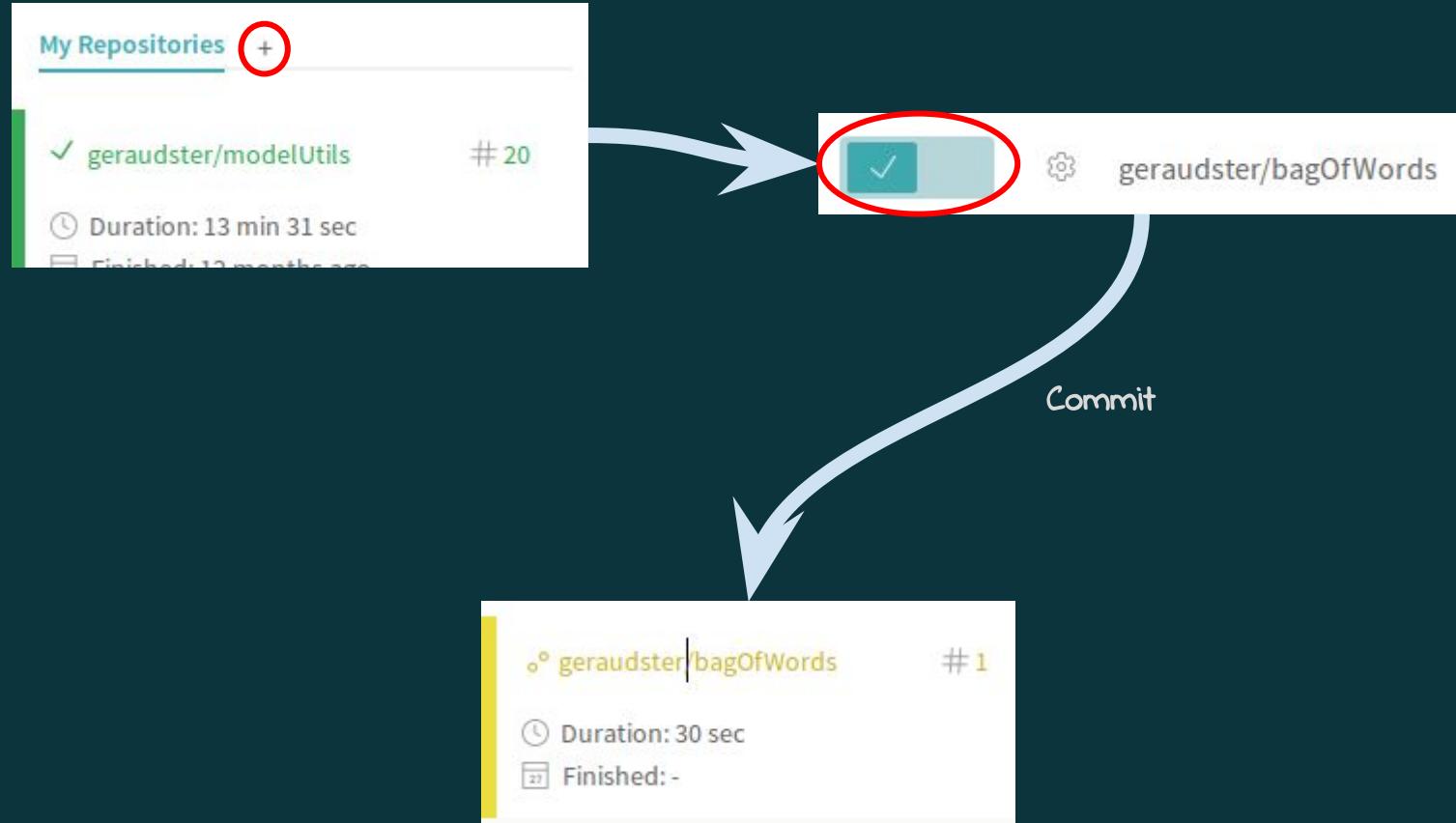
# Le cycle de vie du dev

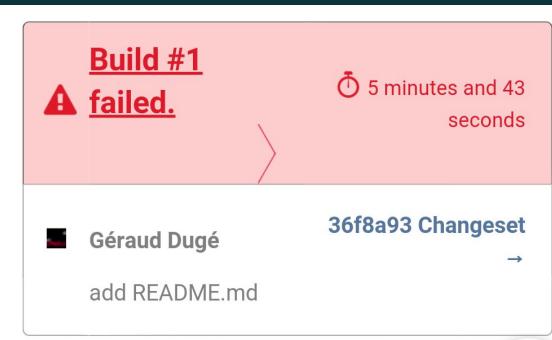
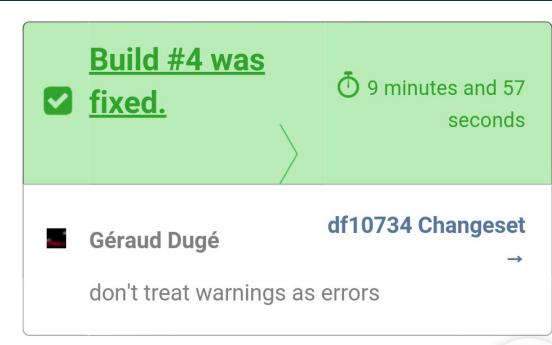
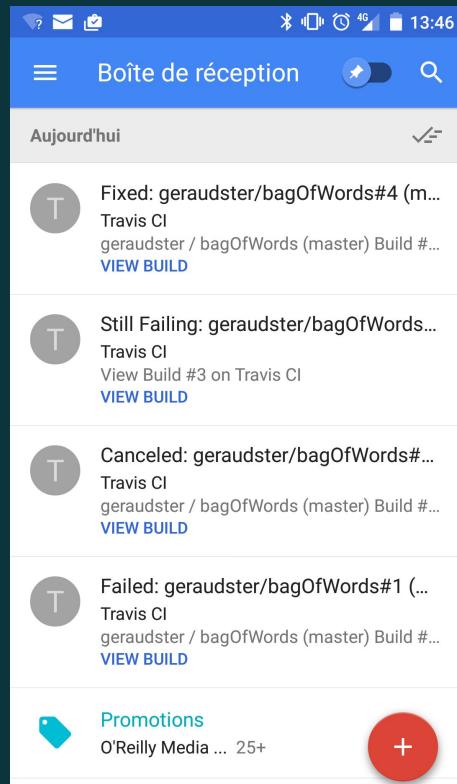


# .travis.yml

```
language: r
```

```
sudo: false
```



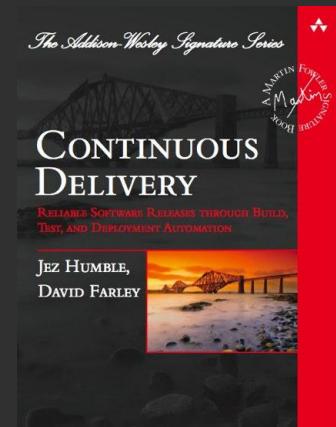
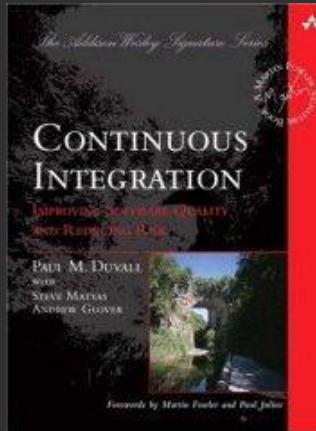


# En savoir plus...

<http://martinfowler.com/delivery.html>  
<https://travis-ci.org/>

@geraudster

MARTINFOWLER.COM



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*Géraud DUGE de BERNONVILLE, Valtech*



*Nathalie Villa-Vialaneix, INRA, UR875, MIAT*

*Sébastien Déjean, IMT, Toulouse.*

*Christophe Bontemps, Toulouse School of Economics -INRA*



# Lightning talks

**Outils pour chercher de l'information sur R  
et se former**

*Nathalie Villa-Vialaneix, INRA, UR875, MIAT*

*Sébastien Déjean, IMT, Toulouse.*

*Christophe Bontemps, Toulouse School of Economics -INRA*

# Outils pour chercher de l'information sur R et se former

Nathalie Villa-Vialaneix, Christophe Bontemps & Sébastien Déjean

- ① où commencer avec R ?
- ② à ne pas manquer !
- ③ à l'aide... !!!



## Où commencer ? Un MOOC... ?

- de nombreux MOOCs sur R ou utilisant R sur coursera, udacity, edX, datacamp, FUN...

- #### ● nous recommandons :

The screenshot shows the Coursera platform interface. At the top, there's a navigation bar with links for Home, Search, Courses, and Help. Below the navigation is a search bar with the placeholder 'Search courses'. The main content area features a large orange header with the text 'Introduction to R' and a 'Start Course for Free' button. To the right is a circular profile picture of a person with the letter 'R' inside it. Below the header, there's a brief course description: 'Learn how to use R, a free open-source programming language. In this course you'll learn about basic command-line operations and how to use R to analyze data sets. Then, you will use R to create beautiful visualizations and make predictions using linear regression models. This course will also provide you with the necessary tools to start learning machine learning algorithms.' Underneath the description is a 'Course Description' section with a detailed text and a 'View Syllabus' link. At the bottom of the page, there's a footer with the Coursera logo, a 'View Syllabus' button, and social media links for LinkedIn, Facebook, and Twitter.



### **My Resources**



# Où commencer ? En interactif...

## On line

**Try R**

In this first chapter, we'll cover basic R expressions. We'll start simple, with numbers, strings, and true/false values. Then we'll show you how to store those values in variables, and how to pass them to functions. We'll show you how to get help on functions when you're stuck. Finally we'll load an R script in from a file.

Let's get started!

**Expressions**      1.1

Type anything at the prompt, and R will evaluate it and print the answer.

Let's try some simple math. Type the below command.

[Or, if you prefer, click on the command and it will be typed into the console for you!]

```
> 1+1  
[1] 2
```

There's your result, **2**. It's printed on the console right after your entry.

Type the string "**Air, matey!**". (Don't forget the quotes!)

```
"Air, matey!"
```

```
> "Air, matey!"
```

<http://tryr.codeschool.com>



## Off line

```
| Please choose a course, or type 0 to exit swirl.  
1: R Programming  
2: Take me to the swirl course repository!  
  
Selection: 1  
  
| Please choose a lesson, or type 0 to return to course menu.  
1: Basic Building Blocks      2: Workspace and Files  
3: Sequences of Numbers      4: Vectors  
5: Missing Values      6: Subsetting Vectors  
7: Matrices and Data Frames      8: Logic  
9: Functions      10: lapply and sapply  
11: vapply and tapply      12: Looking at Data  
13: Simulation      14: Dates and Times  
15: Base Graphics  
  
Selection: 1  
  
|  
| In this lesson, we will explore some basic building blocks of the R  
| programming language.  
...  
|===  
| If at any point you'd like more information on a particular topic related to  
R, you can type help.start() at the prompt, which will open a menu of  
resources (either within RStudio or your default web browser, depending on  
your setup). Alternatively, a simple web search often yields the answer  
you're looking for.  
...  
|=====  
| In its simplest form, R can be used as an interactive calculator. Type 5 + 7  
| and press Enter.  
> 5+7  
[1] 12  
  
| You're the best!  
|======  
| R simply prints the result of 12 by default. However, R is a programming  
language and often the reason we use a programming language as opposed to a  
calculator is to automate some process or avoid unnecessary repetition.  
=
```

`install.packages("swirl")`



# À ne pas manquer ! Les manuels du CRAN...

The R Manuals

edited by the R Development Core Team.

The following manuals for R were created on Debian Linux and may differ from the manuals for Mac or Windows on platform-specific pages, platform are part of the respective R installations. The manuals change with R, hence we provide versions for the most recent released R version and a version for the forthcoming R version that is still in development (R-devel).

Here they can be downloaded as PDF files, EPUB files, or directly browsed as HTML:

## Manual

**An Introduction to R** is based on the former "Notes on R", gives an introduction to the language and how to use R for doing statistical analysis and graphics.

**R Data Import/Export** describes the import and export facilities available either in R itself or via packages which are available from CRAN.

## R Installation and Administration

**Writing R Extensions** covers how to create your own packages, write R help files, and the foreign language (C, C++, Fortran, ...) interfaces.

A draft of **The R language definition** documents the language *per se*. That is, the objects that it works on, and the details of the expression evaluation process, which are useful to know when programming R functions.

**R Internals:** a guide to the internal structures of R and coding standards for the core team working on R itself.

**The R Reference Index:** contains all help files of the R standard and recommended packages in printable form. (9MB, approx. 3500 pages)

## R-release

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# À ne pas manquer ! Les vues thématiques du CRAN...

Bayesian	Bayesian Inference
ChemPhys	Chemometrics and Computational Physics
ClinicalTrials	Clinical Trial Design, Monitoring, and Analysis
Cluster	Cluster Analysis & Finite Mixture Models
DifferentialEquations	Differential Equations
Distributions	Probability Distributions
Econometrics	Econometrics
Envirometrics	Analysis of Ecological and Environmental Data
ExperimentalDesign	Design of Experiments (DoE) & Analysis of Experimental Data
Finance	Empirical Finance
Genetics	Statistical Genetics
Graphics	Graphic Displays & Dynamic Graphics & Graphic Devices & Visualization
HighPerformanceComputing	High-Performance and Parallel Computing with R
MachineLearning	Machine Learning & Statistical Learning
MedicalImaging	Medical Image Analysis
MetaAnalysis	Meta-Analysis
Multivariate	Multivariate Statistics
NaturalLanguageProcessing	Natural Language Processing
NumericalMathematics	Numerical Mathematics
OfficialStatistics	Official Statistics & Survey Methodology
Optimization	Optimization and Mathematical Programming
Pharmacokinetics	Analysis of Pharmacokinetic Data
Phylogenetics	Phylogenetics, Especially Comparative Methods
Psychometrics	Psychometric Models and Methods
ReproducibleResearch	Reproducible Research
Robust	Robust Statistical Methods
SocialSciences	Statistics for the Social Sciences
Spatial	Analysis of Spatial Data
SpatioTemporal	Handling and Analyzing Spatio-Temporal Data
Survival	Survival Analysis
TimeSeries	Time Series Analysis
WebTechnologies	Web Technologies and Services
gR	gRaphical Models in R

CRAN Task View: High-Performance and Parallel Computing with R

**Maintainer:** Dirk Eddelbuettel

**Contact:** [Dirk.Eddelbuettel@R-project.org](mailto:Dirk.Eddelbuettel@R-project.org)

**Version:** 2016-01-28

This CRAN task view contains a list of packages, grouped by topic, that are useful for high-performance computing related to pushing R a little further: using compiled code, parallel computing (in both explicit and implicit forms).

Unless otherwise mentioned, all packages presented with hyperlinks are available from CRAN.

Several of the areas discussed in this Task View are undergoing rapid change. Please send suggestions and corrections by Achim Zeileis, Markus Schmidberger, Martin Morgan, Max Kuhn, Bill Cleveland, Ross Boylan, Ramon Diaz-Urista, and Mark Zelizman (as well as others I may have forgotten).

Suggestions and corrections by Achim Zeileis, Markus Schmidberger, Martin Morgan, Max Kuhn, Bill Cleveland, Ross Boylan, Ramon Diaz-Urista, and Mark Zelizman (as well as others I may have forgotten).

Contributions are always welcome, and encouraged. Since the start of this CRAN task view in GitHub repository (see below) so that pull requests are also possible.

**Direct support in R started with release 2.14.0** which includes a new package **parallel** in the 'parallel'. However, and as explained in the package vignette, the parts of parallel which provide support for multiple RNG streams following L'Ecuier et al. The version released for R 2.14.0 contains base functionality: higher-level convenience functions.

## Parallel computing: Explicit parallelism

- Several packages provide the communications layer required for parallel computing. The **cluster** package is the most actively maintained, but available from its CRAN archive directory.
- In recent years, the alternative MPI (Message Passing Interface) standard has become the access to numerous functions from the MPI API, as well as a number of R-specific extensions. The **mpi** package also contains support for multiple RNG streams following L'Ecuier et al. The version released for R 2.14.0 contains base functionality: higher-level convenience functions.
- The **pbdMPI** package provides S4 classes to directly interface MPI in order to support the builds on this and uses scalable linear algebra packages (namely BLACS, PBLAS, and ScaLAPACK) for distributed data types upon which the **pbdDMAT** builds to provide distributed dense matrices (with MPI-based matrix multiplication) and supports terabyte-sized files. The **pbdDEMO** package provides examples for using MPI with R.
- An alternative is provided by the **nws** (NetWorkSpaces) packages from REvolution Compu-
- The **snow** (Simple Network of Workstations) package by Tierney et al. can use PVM, MPI, provides fault-tolerance extensions to **snow**.
- The **snowfall** package by Knauf provides a more recent alternative to **snow**. Functions can be run in parallel across multiple cores.
- The **foreach** package allows general iteration over elements in a collection without the use of loops (using parallel/multicore or single workstations), **doSNOW** (using **snow**, see above), **doMC** (using **multicore**), **doParallel** (using **parallel**), **doFuture** (using **future**), **doRedis** (using **redis**), **doRabbitMQ** (using **rabbitmq**), **doKernc** (using **kernc**), **doMPI** (using **mpi**), **doTbb** (using **tbb**), **doOpenCL** (using **opencl**), **doCores** (using **cores**), **doRedis** (using **redis**), **doRabbitMQ** (using **rabbitmq**), **doKernc** (using **kernc**), **doMPI** (using **mpi**), **doTbb** (using **tbb**), **doOpenCL** (using **opencl**), **doCores** (using **cores**), **doRedis** (using **redis**), **doRabbitMQ** (using **rabbitmq**), **doKernc** (using **kernc**), **doMPI** (using **mpi**), **doTbb** (using **tbb**), **doOpenCL** (using **opencl**), **doCores** (using **cores**), **doRedis** (using **redis**), **doRabbitMQ** 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# À ne pas manquer ! Les feuilles de triche de RStudio

## R Markdown Cheat Sheet

R Markdown is an authoring format that makes it easy to write reusable reports with R. You combine your R code with narration written in markdown (an easy-to-read plain text format) and then export the results as an html, pdf, or word file. You can even reuse R Markdown to build interactive documents and slide shows. [Read Version](#).

[DOWNLOAD](#)

## RStudio IDE Cheat Sheet

The RStudio IDE is the most popular integrated development environment for R. Do you want to write, run, and debug your own R code? Work collaboratively on R projects with version control? Build packages or create documents and apps? No matter what you do with R, the RStudio IDE can help you do it faster. This cheat sheet will guide you through the most useful features of the IDE, as well as the long list of keyboard shortcuts built into the RStudio IDE.

[DOWNLOAD](#)

## Shiny Cheat Sheet

If you're ready to build interactive web apps with R, say hello to Shiny. This cheat sheet provides a tour of the Shiny package and explains how to build and customize an interactive app. Be sure to follow the links on the sheet for even more information.

[DOWNLOAD](#)

## Data Visualization Cheat Sheet

The ggplot2 package lets you make beautiful and customizable plots of your data. It implements the grammar of graphics, an easy-to-use system for building plots. See [docs.ggplot2.org](#) for detailed examples.

[DOWNLOAD](#)

## 2 feuilles sur des généralités

### Advanced R Cheat Sheet

Created by: Aronne Cullen and Sean Chen

#### Environment Basics

Environment: Data structure (with two components below) that powers the lexical scope of code.

Create environments: env<-new.env()

1. Named list (list of names) - each name points to an object stored somewhere in memory.

If an object has no names pointing to it, it gets automatically derived by the garbage collector.

• Access with: .env\$[x]

2. Parent environment - used to implement scoping rules. If an object does not reside in an environment, then R will look in its parent (and on).

• Access with: parent.env(x)\$[x]

#### Special environments

1. Global environment - ultimate ancestor of all environments.

• Parent: none

• Access with: .GlobalEnv

2. Base environment - environment of the base package

• Parent: empty environment

• Access with: .baseEnv

3. Global environment - the interactive workspace that you normally work in

• Parent: environment of last attached package

• Access with: .globalEnv

4. Current environment - environment that you are currently working in (make sure to be one of the above)

• Parent: empty environment

• Access with: .env

#### Assignment & Values

Assignment - act of binding (or referencing) a name to a value in an environment.

1. c() (Physical assignment) - always creates a variable in the current environment

2. assign() - creates a variable, modifies or reassigns variable based on updating the parent environment

Warning: If you don't find an existing variable, it will create one in the global environment

NOTE: Assignments are tracked by R (big downside when needed)

#### Blinding Names to Values

Assignment - act of binding (or referencing) a name to a value in an environment.

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Warning: If you don't find an existing variable, it will create one in the global environment

NOTE: Assignments are tracked by R (big downside when needed)

#### Environments

Parent Environment

• Enclosing environment - environment where the function was created. It determines how function looks.

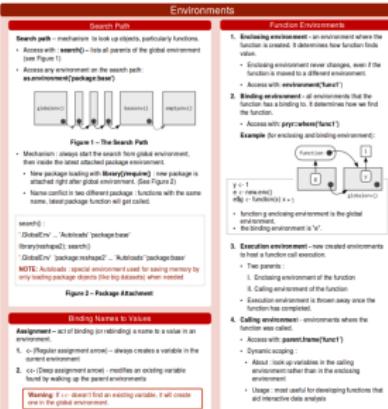
- Ensuring environment never changes, even if the function moves to a different environment.

• Access with: environment(function)

2. Binding environment - all environments that the function is bound to. It remembers how we found the function.

• Access with: parent.env(function)

Example for existing and binding environment:



Updated 2/16

## 7 feuilles sur des outils de RStudio

### Data Wrangling with dplyr and tidyverse Cheat Sheet

Studio

#### Syntax

Syntax - Helpful conventions for wrangling

Input: `tbl_df, tibble`

Converts data to tibble class. It's easier to examine than data frames. R displays only the data that fit on screen.

Output: `tbl, data.frame`

Converts tibble back to data frame.

Input: `tbl, data.frame`

Information domain summary of the data.

Output: `tbl`

View data set in spreadsheet-like display (like Capital V).

Input: `tbl`

Subset observations (Rows)

Output: `tbl`

Extract rows that meet logical criteria.

Input: `tbl`

Subset variables (Columns)

Output: `tbl`

Select columns by name or regular expression.

Input: `tbl`

Helper functions for select / distinct

Output: `tbl`

Count the number of data frames.

Input: `tbl`

Count the number of data frames.

# À ne pas manquer ! Bioconductor et ses vignettes...

edgeR

platforms some downloads top 5% posts 114 / 2 / 3 / 24 in BioC 7.5 years  
build ok commits 2,67 test coverage 41%



This is the **development** version of edgeR; for the stable release version, see [edgeR](#).

## Empirical Analysis of Digital Gene Expression Data in R

Bioconductor version: Development (3.4)

Differential expression analysis of RNA-seq expression profiles with biological replication. Implements a range of statistical methodology based on the negative binomial distributions, including empirical Bayes estimation, exact tests, generalized linear models and quasi-likelihood tests. As well as RNA-seq, it be applied to differential signal analysis of other types of genomic data that produce counts, including ChIP-seq, SAGE and CAGE.

Author: Yunshun Chen <yuchen at wehi.edu.au>, Aaron Lun <alun at wehi.edu.au>, Davis McCarthy <dmcCarthy at wehi.edu.au>, Xiaobei Zhou <xiaobei.zhou at uzh.ch>, Mark Robinson <mark.robinson at imls.uzh.ch>, Gordon Smyth <smyth at wehi.edu.au>

Maintainer: Yunshun Chen <yuchen at wehi.edu.au>, Aaron Lun <alun at wehi.edu.au>, Mark Robinson <mark.robinson at imls.uzh.ch>, Davis McCarthy <dmcCarthy at wehi.edu.au>, Gordon Smyth <smyth at wehi.edu.au>

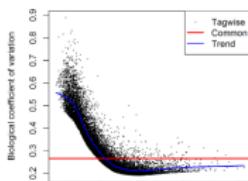
Citation (from within R, enter `citation("edgeR")`):

## Extrait de la vignette (104 pages)

### 4.2.7 Estimating the dispersion

Estimate the genewise dispersion estimates over all genes, allowing for a possible abundance trend. The estimation is also robustified against potential outlier genes.

```
> y <- estimateDisp(y, design, robust=TRUE)
> y$common.dispersion
[1] 0.0765
> plotBCV(y)
```



### BioC 2016

Join us for our annual conference  
[BioC 2016: Where Software and Biology Collide](#), this year at  
Stanford University, June 24-26  
(DeVore Auditorium, 250, 2nd floor)

### About Bioconductor

Bioconductor provides tools for the analysis and interpretation of high-throughput genomic data. Bioconductor uses the R statistical programming language, and is open source software. Bioconductor has two releases each year ([1.11 software packages](#)), and an active user community. Bioconductor is available as an [R package](#) (Amazon Machine Images) and a series of [bioconductor.org](#) images.

### News

- Bioconductor 3.4 is available
- Release notes: [3.4.0](#) | [Change log](#)
- Introducing high-throughput genomic analysis with Bioconductor ([bioconductor.org](#))
- Read our latest [bioRxiv](#) and [causes](#) ([bioRxiv.org](#))
- Use the [support site](#) to get help installing, learning and using Bioconductor.



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## Browse packages by topic

All Packages

Bioconductor version 3.3 (Release)

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» AssayDomain (43)	
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DNAmethylation (50)	
ExonArray (4)	
GeneExpression (200)	
GeneticVariability (30)	
SAP (57)	
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Packages found under DNAmethylation:	
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BEAT	Kemal Akman
Beivar	Hårikur Mørk
BSseq	Katja Heesters
BSseqs	Kasper Daniel Hørsle
Burmester	Rafael A. Irizarry
CHAMP	Yuan Yan, Tiffany Morris
Charm	Peter Maruskin
CDNAFP	Charles Werten
cMet	Tiphaine Martin
CAGEOME	Volker Heyenstädt
CoexNumber450k	Simon Popkin-Cavanaugh
CMRcaller	Nicole Radu Zelot
CMRcaller	Tim Peters
CMRcallerPars	Martin IJlaardam

Search table



## Explore workflows

### Basic Workflows

- **Sequence Analysis**: Import fastq, fasta, BAM, gff, bed, wig, and other sequence formats. Then, filter, align, and manipulate sequences. Perform quality assessment, QCFQ-test, differential expression, RMA-seq, and other workflows. Access the Sequence Read Archive.

- **Differential Analysis**: Import Affymetrix, BioRna, Nimblegen, Agilent, and other platforms. Perform differential gene expression analysis. Use GSEA for pathway enrichment analysis, GSEA3 for pathway enrichment, genetical genetics and other workflows for expression, exon, copy number SNVs, methylation and other assays. Access GEO, ArrayExpress, WormBase, UCSC, and other community resources.

- **Annotating Genomes**: Introduces to using gene, pathways, gene ontology, homology annotations and the Annotationdb. Access GO, KEGG, NCBI, Biomart, UCSC, vendor, and other sources.

- **Annotating Genomic Regions**: Represent genomic data types (e.g., Trans BAM, gff, bed, and gtf files) as genomic ranges for simple and advanced range-based queries.

- **Protein Sequencing**: Import protein sequences and perform protein sequencing of variants and compute amino acid coding changes for non-synonymous variants. Use SIFT and PolyPhen database packages to predict consequence of amino acid coding changes.

- **Change-point detection systems with tractable P-values**: The iDPN package developed in conjunction with the UCSC genome browser provides an easy way for transforming data in Gff3 formats. This is illustrated here with an image of the NISTI GWAS catalog that is, as of Oct. 31 2014, distributed with coordinates defined by NCBI build hg38.

### Advanced Workflows

- **High Throughput**: Import, transform, edit, analyze and visualize raw cytometry, mass spec, HiSeqC, cell-based, and other assays.

- **RNA-seq**: Import, process, analyze, and differential expression. This site will walk you through an end-to-end RNA-seq differential expression workflow, using DESeq2 along with other Bioconductor packages. We will start from the FASTQ files, show how these were aligned to the reference genome, how to estimate gene expression levels, how to remove low-quality transcripts, perform exploratory data analysis (EDA), perform differential gene expression analysis with DESeq2, and visually explore the results.

- **Mass spectrometry and proteomics**: This site demonstrates how to access data from proteomics data repositories, how to parse various mass spectrometry data formats, how to identify MS spectra and

## RNA-seq workflow: gene-level exploratory analysis and differential expression

Michael Love [1], Simon Anders [2,3], Vladislav Kim [3], Wolfgang Huber [3]

[1] Department of Biostatistics, Dana-Farber Cancer Institute and Harvard School of Public Health, Boston, US;

[2] Institute for Molecular Medicine Finland (FIMM), Helsinki, Finland;

[3] European Molecular Biology Laboratory (EMBL), Heidelberg, Germany.

## Short links

- Counting reads
- Building a DESeqDataSet
- Exploratory analysis and visualization
- Differential expression
- Plotting results
- Annotating and exporting results
- Accounting for unknown batches
- Time course experiments
- Session information and references

## Abstract



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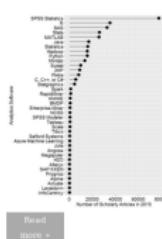
If you are an R blogger yourself you are invited to add your own R content feed to this site (Non-English R bloggers should add themselves here)

[JOBS FOR R-USERS](#)

## R Passes SAS in Scholarly Use (finally)

June 7, 2016

By muenchen.bob@gmail.com



Way back in 2012 I published a forecast that showed that the use of R for scholarly publications would likely pass the use of SAS in 2015. But I didn't believe the forecast since I expected the sharp decline in SAS ... Continue reading →

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### RECENT POPULAR POSTS

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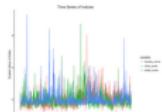
### MOST VISITED ARTICLES OF THE WEEK

- How to write the first for loop in R
- Installing R packages
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- Predictive Bookmaker Consensus Model for the UEFA Euro 2016
- In-depth introduction to machine learning in 15 hours of expert videos
- What are the Best Machine Learning Packages in R?
- Using apply, sapply, lapply in R
- How to perform a Logistic Regression in R
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June 7, 2016

By Sam Weiss



## Analyze Face Emotions with R

June 7, 2016

By Daniel Boiles



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## R code coverage support via docker

December 17, 2014

By R2D2

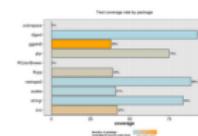
R code coverage support via docker 2014-12-17 Source In my previous post , I used a R with built-in code coverage to compute the code coverage of some packages. Today I will show you how to install and use such a R with code coverage support. I just created a public docker container that provides this patched R. If you do not...

[Read more »](#)

## Test coverage of the 10 most downloaded R packages

May 2, 2014

By R2D2



Test coverage of the 10 most downloaded R packages 2014-04-30 Source Introduction How do you know that your code is well tested ? The test coverage is the proportion of source code lines that are executed (covered) when running the tests. It is useful to find the parts of your code that are not exercised no matter how...

[Read more »](#)

## An example of monkey patching a package

August 1, 2013

By R2D2



# À ne pas manquer ! Un grand Wiki...

## R Programming

The latest reviewed version was checked on 22 October 2023. There are template/file changes awaiting review.



### Editor's note

This book is still under development. Please help us.

### Welcome to the R programming Wikibook

This book is designed to be a practical guide to the **R programming language**<sup>[1]</sup>.

R is free software designed for statistical computing. There is already great documentation for the standard R packages on the Comprehensive R Archive Network (CRAN)<sup>[2]</sup> and many resources in specialized books, forums such as Stackoverflow<sup>[3]</sup> and personal blogs<sup>[4]</sup>, but all of these resources are scattered and therefore difficult to find and to compare. The aim of this Wikibook is to be the place where anyone can share his or her knowledge and tricks on R. It is supposed to be organized by task but not by discipline<sup>[5]</sup>. We try to make a cross-disciplinary book, i.e. a book that can be used by all people applying statistics to some specific fields.

#### How can you share your R experience ? [\[edit\]](#)

- Explain the syntax of a command
  - Compare the different ways of performing each task using R.
  - Try to make unique examples based on fake data (or simulated data sets).
  - As with any Wikibook please feel free to make corrections, expand explanations, and make additions where necessary.
- Some rules :
- Put the name of functions in the code environment : `<code>la()</code>`
  - Put the name of packages in bold : `<b>stats</b>`
  - Except for the default packages, put the name of the package in parentheses after each function : `<code>MCMCprob()</code>` ("MCMCpack")
  - Put examples in the source environment with argument `lang="rplus"` : `<source lang="rplus"></source>`
  - Use references to package documentation, academic literature and wikipedia.
  - Use the citations templates to make citations : [Template:Cite book](#), [Template:Cite web](#), [Template:Cite journal](#)
  - If you want to add a graph, you should load it on Commons and add the tag {{Created with R}} and, if it is applicable, {{Category:Images with R source code}}.

#### Prerequisites [\[edit\]](#)

We assume that readers have a background in statistics. This book is not a book about statistics but a book about how to implement statistical methods using R. We try to use terms which are already defined on Wikipedia such that people can refer to the corresponding wikipedia page each time they have some doubts on a notion.

We also assume that readers are familiar with computers and that they know how to use software with a **command-line interface**. There are some graphical user interfaces for R but we are not going to explain how to use them in this textbook. Beginners should have a look at the **Sample session** for a first session with R. They can also have a look at the **Statistical Analysis: An Introduction using R** book.

#### See also [\[edit\]](#)

[https://en.wikibooks.org/wiki/R\\_Programming](https://en.wikibooks.org/wiki/R_Programming)



## R Programming



### R Basics

- [Introduction](#)
- [Sample Session](#)
- [Manage your workspace](#)
- [Settings](#)
- [Documentation](#)
- [Control Structures](#)
- [Working with functions](#)
- [Debugging](#)
- [Using C or Fortran](#)
- [Utilities](#)
- [Estimation utilities](#)
- [Packages](#)

### Data Management

- [Data types](#)
- [Working with data frames](#)
- [Importing and exporting data](#)
- [Text Processing](#)
- [Times and Dates](#)

### Graphics

- [Grammar of graphics](#)
- [Publication quality output](#)
- [Descriptive Statistics](#)
- [Mathematics](#)
- [Optimization](#)
- [Probability Distributions](#)
- [Random Number Generation](#)

### Statistical Core Methods

- [Maximum Likelihood](#)
- [Method of Moments](#)
- [Bayesian Methods](#)
- [Bootstrap](#)
- [Multiple Imputation](#)
- [Nonparametric Methods](#)

### Regression Models

- [Linear Models](#)
- [Quantile Regression](#)
- [Binomial Models](#)
- [Multinomial Models](#)
- [Tobit And Selection Models](#)
- [Count Data Models](#)



# À l'aide !!!! Avec de vrais gens...

En anglais

The screenshot shows the Stack Overflow homepage with a search bar at the top. Below it, there's a section for "Tagged Questions" with a dropdown menu for "Advanced". The main content area displays several questions tagged with "r".

- read.xls and utf on Windows in R**: I have seen many posts on here about reading excel with a .xls and they all worked on my Mac, but now when I am trying to use the code on my Windows computer, it is not working. I used the below code... (asked 5 mins ago)
- How to read a table from an ESRI file geodatabase (.gdb) using R**: I am trying to read a table from an ESRI file geodatabase (.gdb) that has no geometry using R. readGDB is throwing an error because there is no geometry defined, which kind of makes sense. Load module ... (asked 7 mins ago)
- Rpy2 installing r\_home error**: I am trying to install rpy2 library on Windows from command line through pip and getting following error: > Collecting rpy2 Using cached rpy2-0.8.0.tar.gz > Complete output from command ... (asked 7 mins ago)
- reason behind the transformation of a single columned data frame to a vector after subsetting**: I have a single columned data frame structure. Based on a condition, I am subsetting the data frame during run time. I have observed that the data frame is being converted into a vector after ... (asked 12 mins ago)

<http://stackoverflow.com/questions/tagged/r>

... ou en français

The screenshot shows a forum page titled "Questions en cours" (Questions in progress) for the "R" category. It includes a search bar and a navigation bar with tabs like "Toutes les discussions" and "Discussions actives".

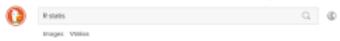
Titre	Auteur	Date	Nombre de réponses
Les 3° rencontrées, le 22 et 24 juil., Noidaue	par Christophe_Grenier	28 Jan 2016, 17:01	202
Problème de serveur R	par François_Bonnot	03 Juin 2015, 11:39	518
IMPORTANT : Objectifs du forum	par François_Bonnot	12 Déc 2007, 06:58	6666
Comment s'inscrire sur le forum	par François_Bonnot	03 Août 2007, 11:57	645
Problème de serveur de forum	par François_Bonnot	03 Août 2007, 11:47	7127
Problème rserve3	par Delphine_Cornet	08 Juin 2015, 11:02	29
Sous Windows 7 il ne peut pas lire "xyz"	par Alain_Bonnot	03 Juin 2015, 08:53	1
If else dans boucle for	par Delphine_Cornet	31 Mai 2015, 11:03	2
lire un fichier BLOOCK	par Benoît_BOUCHA	08 Juin 2015, 09:34	0
R-Studio : Importation fichier Excel + Fusion	par Christophe_Grenier	08 Juin 2015, 09:17	3
Création Tableau Réponse par groupe via Mat générale	par Christophe_Grenier	07 Juin 2015, 14:34	199
Problème installation package report	par Christophe_Grenier	05 Juin 2015, 17:02	1
crée des cartes avec un fichier arcade	par ben_Mitrea	31 Mai 2015, 08:05	80
équilibrer une matrice avec la méthode de la plus petite valeur	par Christophe_Grenier	05 Juin 2015, 10:03	2
RECHERCHE D'INFORMATIONS	par SALIMOU_Melissa	31 Mai 2015, 17:18	2

<http://forums.cirad.fr/logiciel-R>



# À l'aide !!!! GI(not)YF

## Une bête étude comparée... avec mon canard préféré



## contre leur concurrent spécialisé



<http://rseek.org>

et son concurrent le plus célèbre



# Conclusion





## Lightning talks

*Nathalie Villa-Vialaneix, INRA, UR875, MIAT*

*Sébastien Déjean, IMT, Toulouse.* ➔

*Christophe Bontemps, Toulouse School of Economics -INRA*



*Yan Holtz, Centre international d'études supérieures  
en sciences agronomiques*

Cinquièmes Rencontres R



Toulouse  
du 22 au 24 juin 2016



# Lightning talks

**The R Graph Gallery: une core-collection de graphiques R**

*Yan Holtz, Centre international d'études supérieures en sciences agronomiques*



# The R Graph Gallery

Rencontres R, Toulouse, June 2016

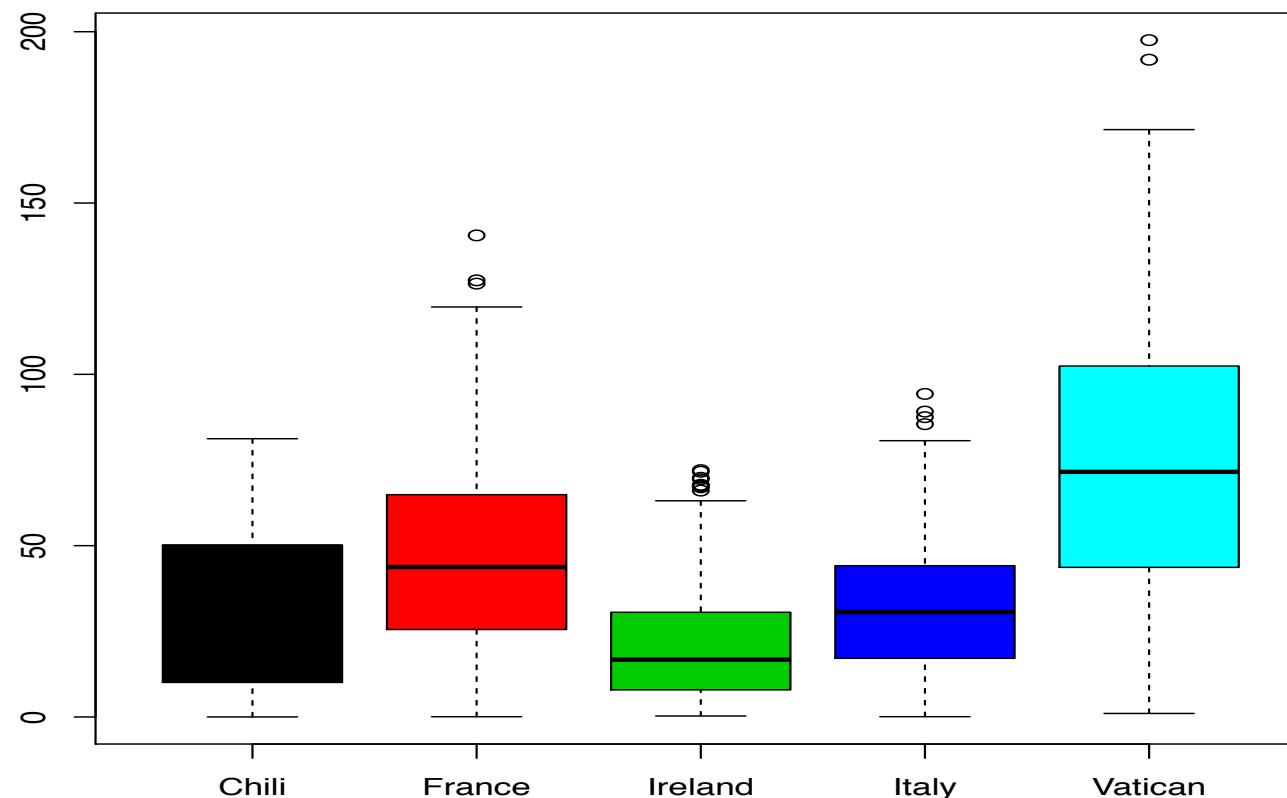
*Yan Holtz, holtz@supagro.fr*

## A quick basic graph

names	country	drink
Chelsea	France	45.629739
Marissa	Ireland	5.906875
Mara	France	36.089158
A'Tiana	Chili	13.052119
...	...	...
Fardowsa	Ireland	5.573123
Makayla	Vatican	83.58251



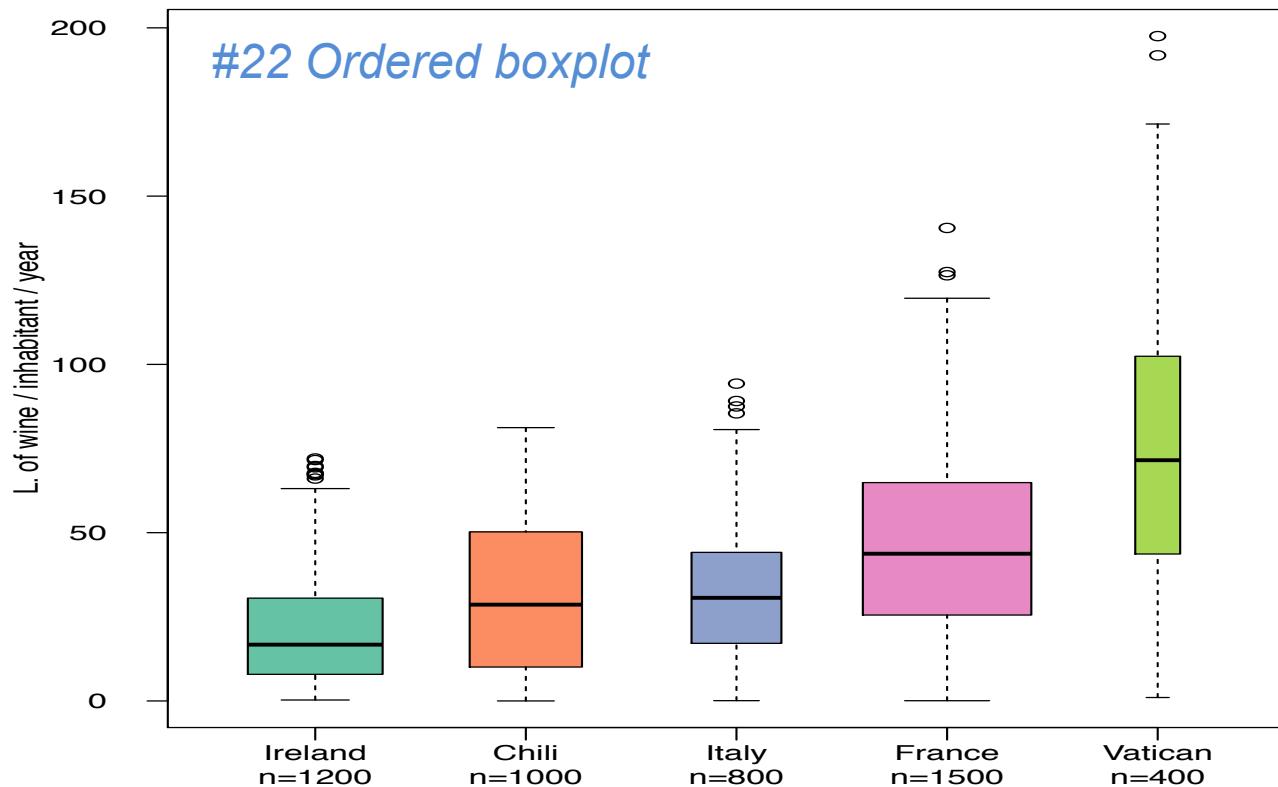
```
boxplot(data$drink ~ data$country, col=c(1:5) )
```



- R = high efficiency to produce simple graphics.
- But more work is needed for an attractive communication

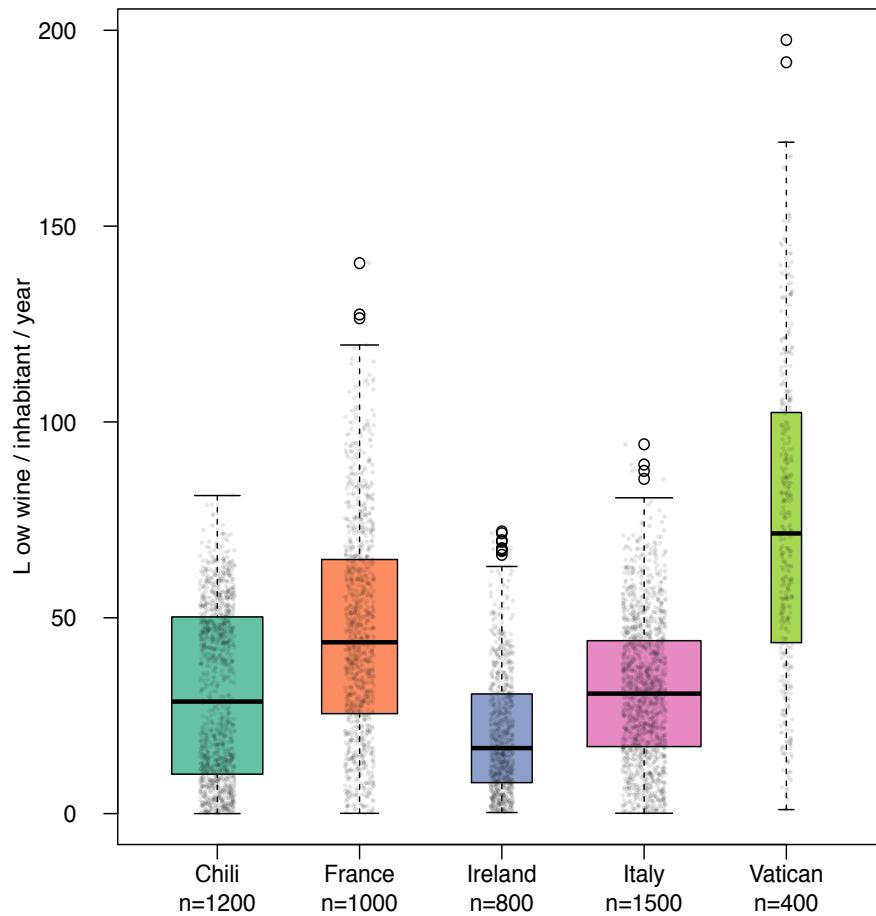
## ... the custom version!

```
library("RColorBrewer")
par(mgp=c(3,1.5,0) , mar=c(4,5,2,2) )
proportion=table(data$country)/nrow(data)
new_order <- with(data, reorder(country , drink, median))
boxplot(data$drink ~ new_order , ylab="L. of wine / inhabitant / year" , col=brewer.pal(5, "Set2") , las=1 ,
width=proportion, xaxt="n" )
axis(1, at=c(1:5) , labels=paste(levels(data$country),table(data$country),sep="\nn=") )
```

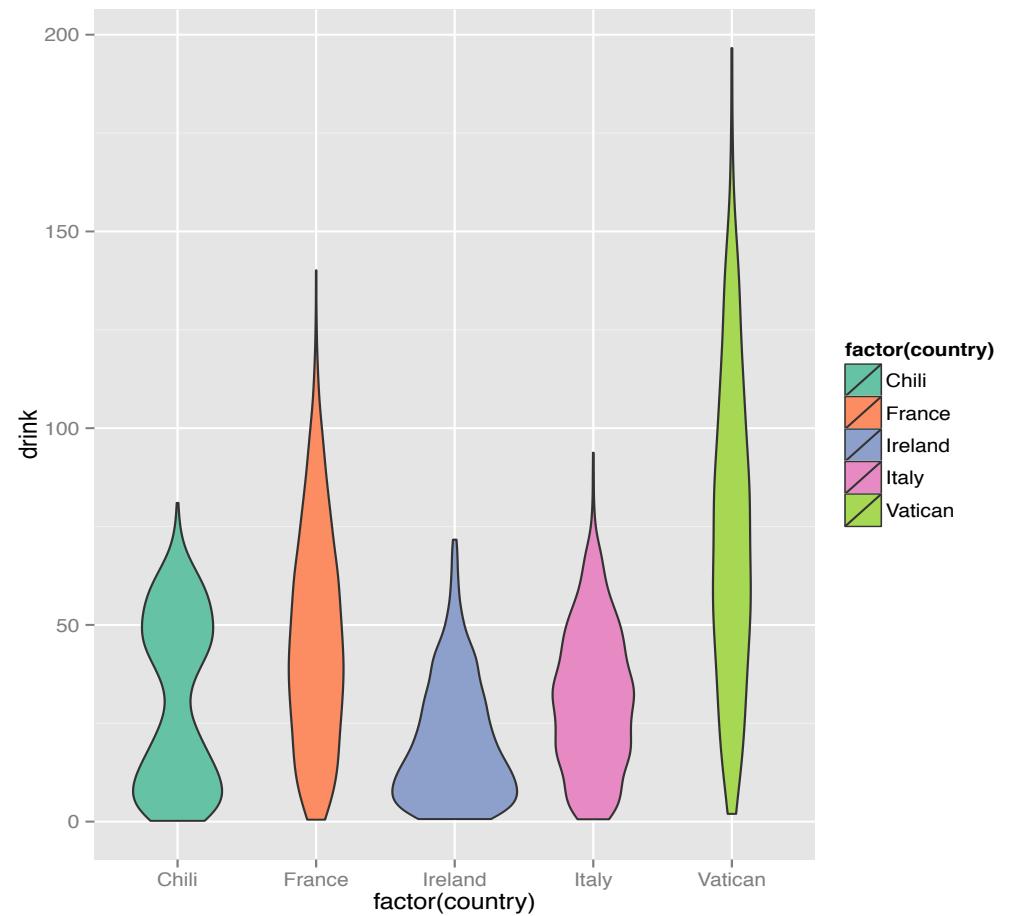


- Better graph=better understanding
- Hard to remember every option!

#96 Boxplot with jitter

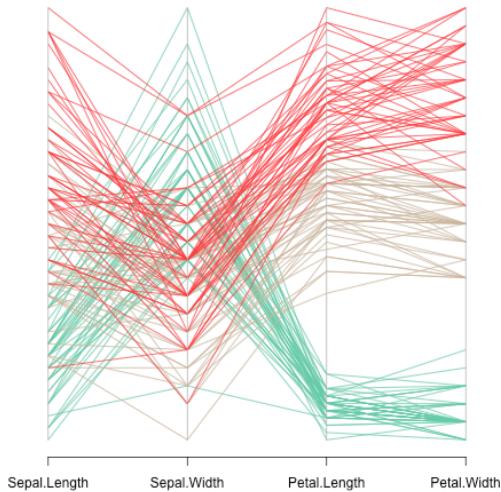


#95 Violin Plot

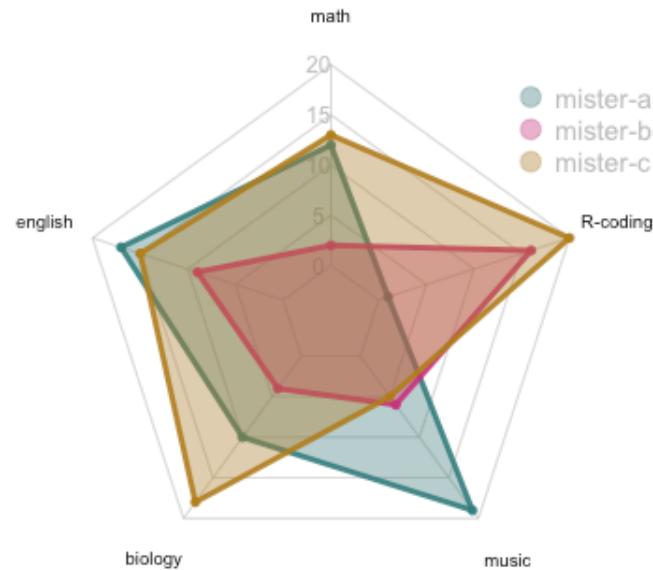


- DataViz is **not only aesthetic!**
- Do you know every **chart possibility?**

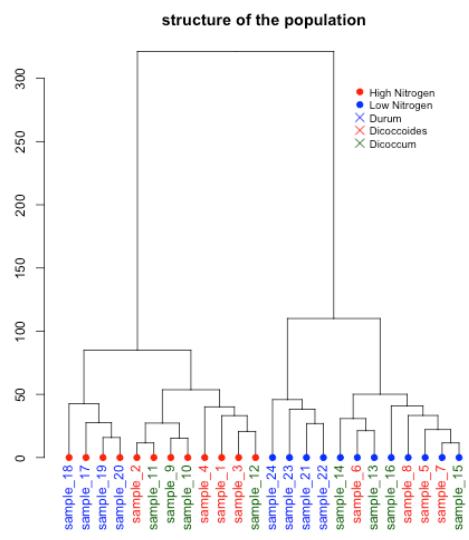
# A world of possibilities



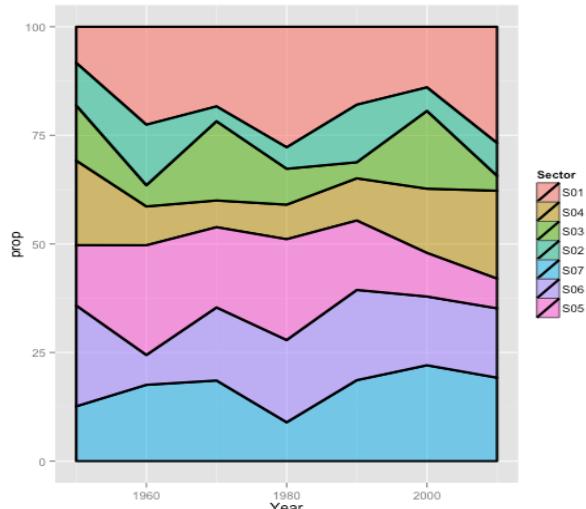
#93 Parallel plot



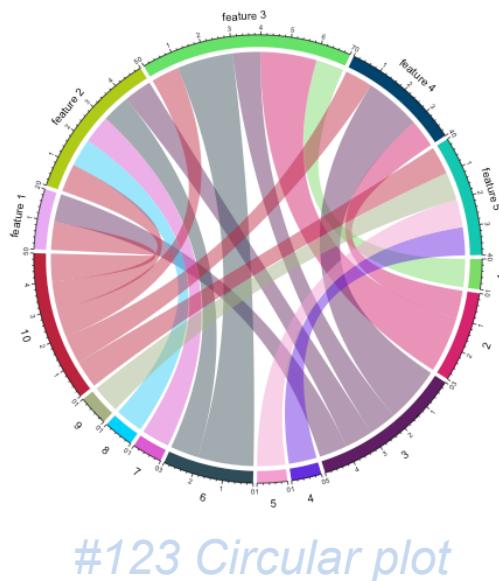
#143 Spider Graph



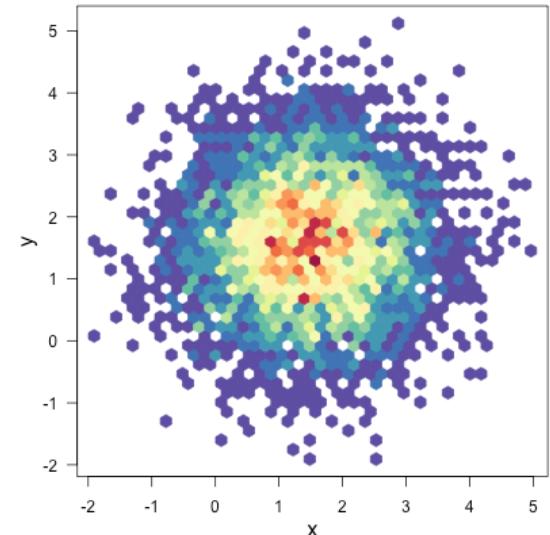
#31 Clustering tree



#136 Stacked area



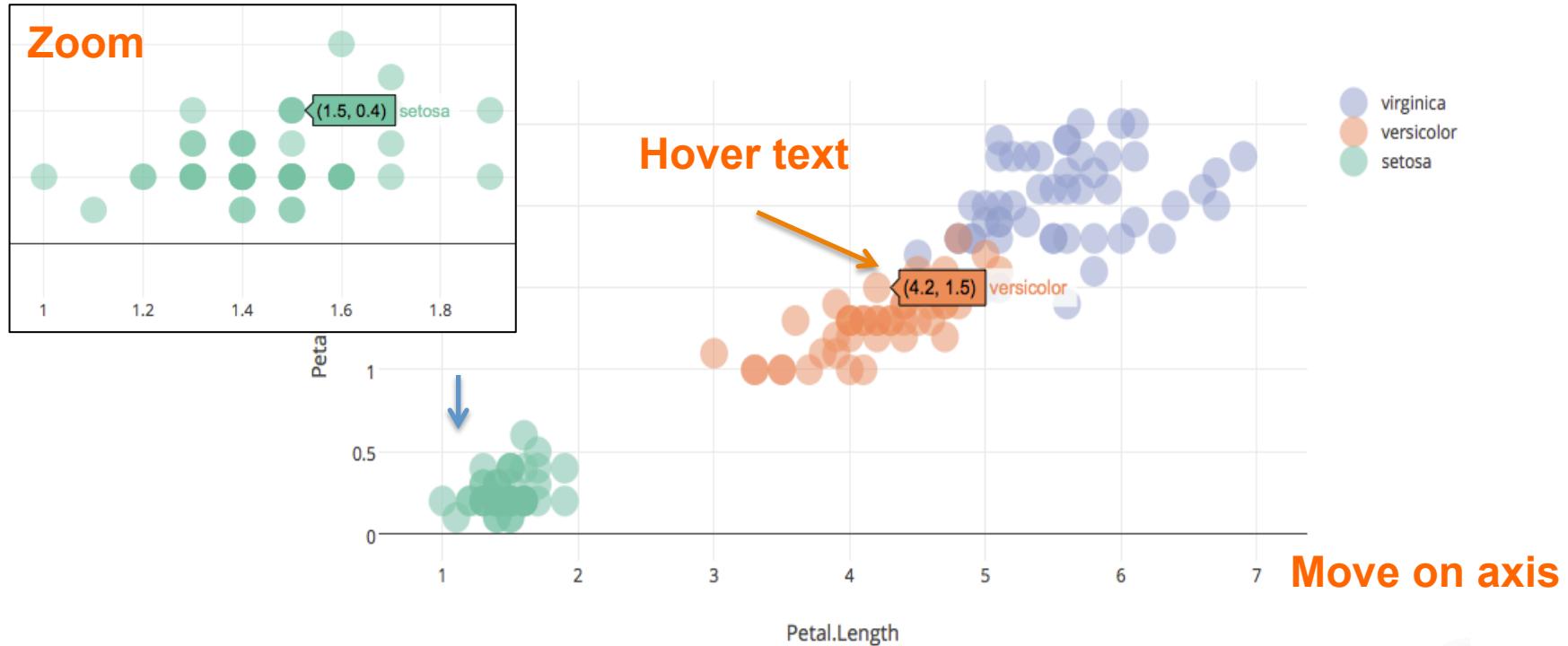
#123 Circular plot



#100 scatter & binning

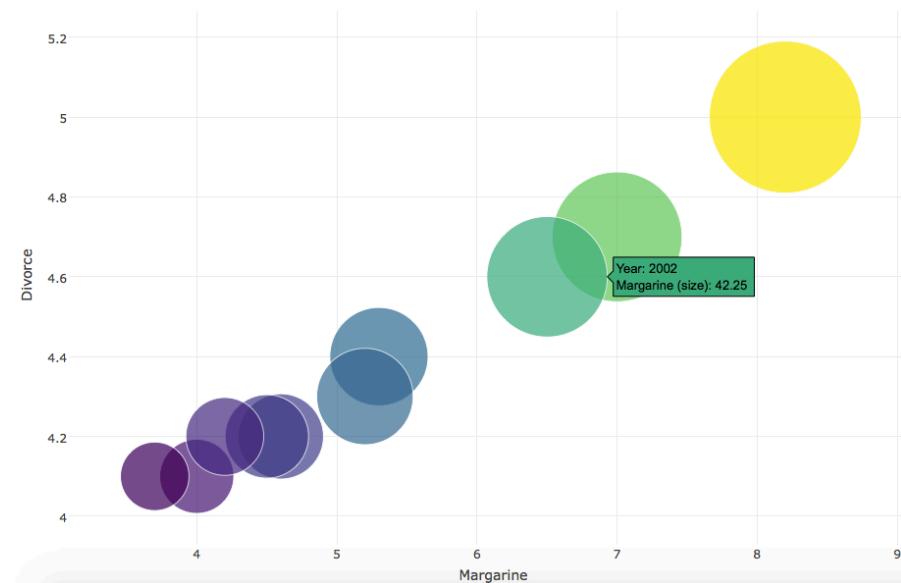
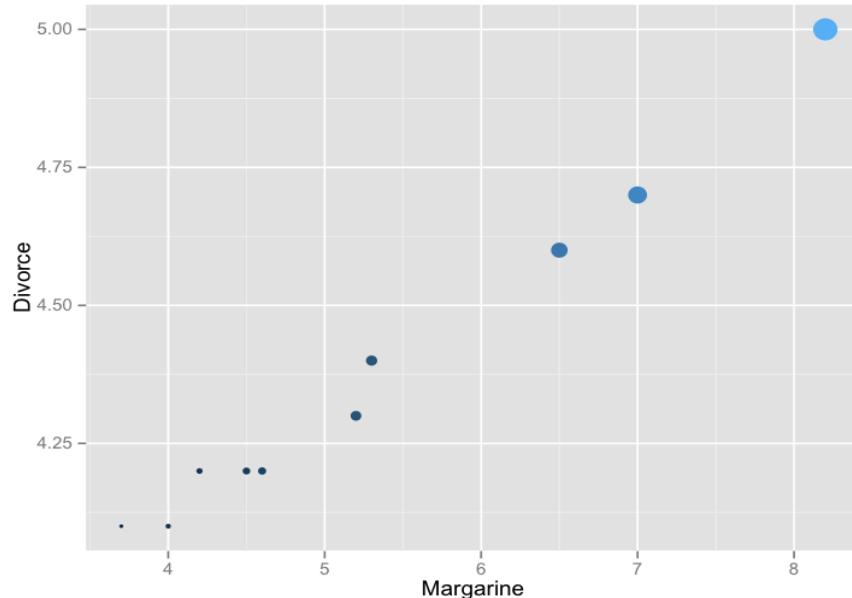
## Next step: Interactive plots with the **HTML widgets**

**HTML widgets:** Dygraph - Leaflet - Plotly - rbokeh - visNetwork - networkD3 - DataTables - Threejs - Rglwidget - DiagrammeR - HighCharter - MetricsGraphics – [www.htmlwidgets.org/](http://www.htmlwidgets.org/)



- Interactivity=better access to information
- Bring your **data to life!**
- Interactivity with R is **easy**

## Plotly



```
qplot(  
  data=data, x=Margarine, y=Divorce,  
  colour = Margarine,  
  size=Margarine  
)
```

```
plot_ly(  
  data, x=Margarine , y=Divorce ,  
  size=Margarine,  
  color=Margarine,  
  mode="markers" ,  
  text=paste("Year: ",year,sep="") ,  
  hoverinfo="text"  
)
```

- Plotly : syntax is close to ggplot2
- Possibility to share your graphics

## Shiny

- Shiny: Turn your R analyses into interactive web applications
- <http://shiny.rstudio.com/>
- Combine the functionality of shiny, the aesthetics of ggplot2 & the interactivity of plotly!

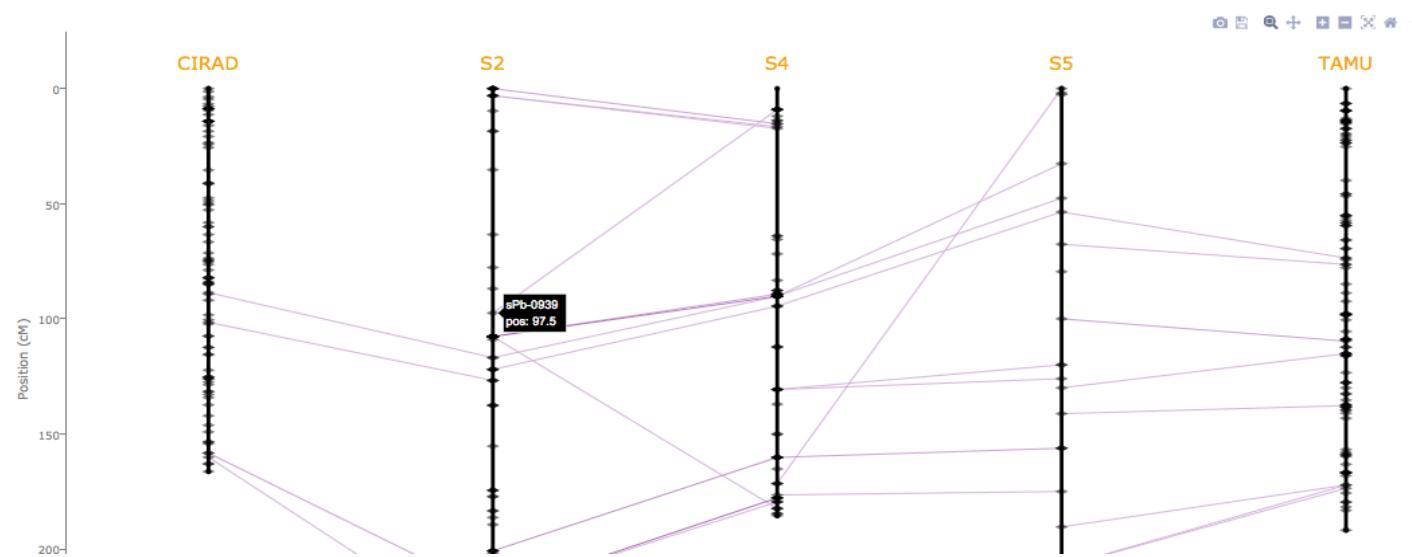


### - Maps comparison -

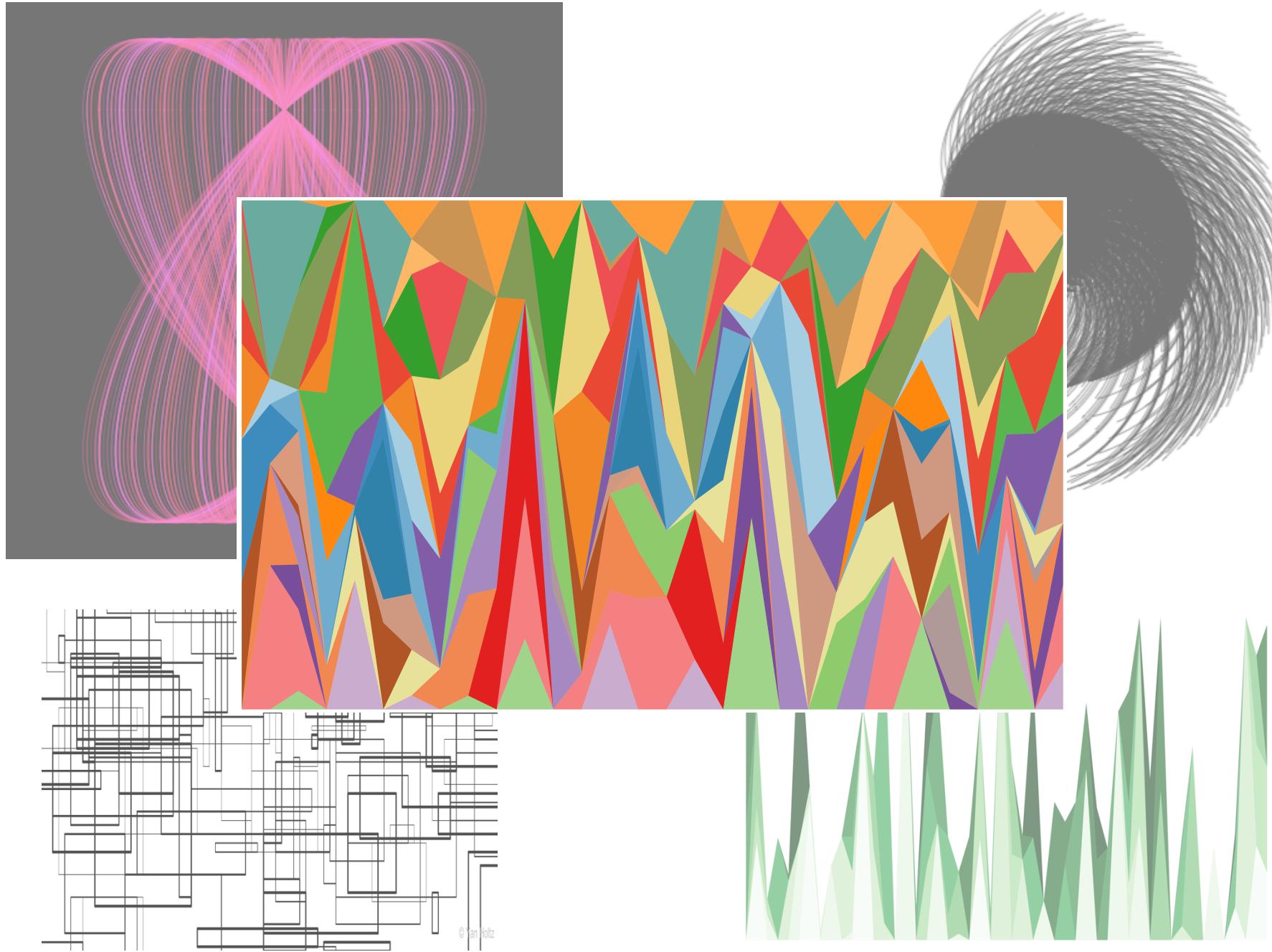
Ergo ego senator inimicus, si ita vultis, homini, amicus esse, sicut semper fui, rei publicae debeo. Quid? si ipsas inimicitias, depono rei publicae causa, quis me tandem iure reprehendet, praesertim cum ego omnium meorum consiliorum atque factorum exempla semper ex summorum hominum consilii atque factis mihi censuerim petenda.

Choose chromosome!

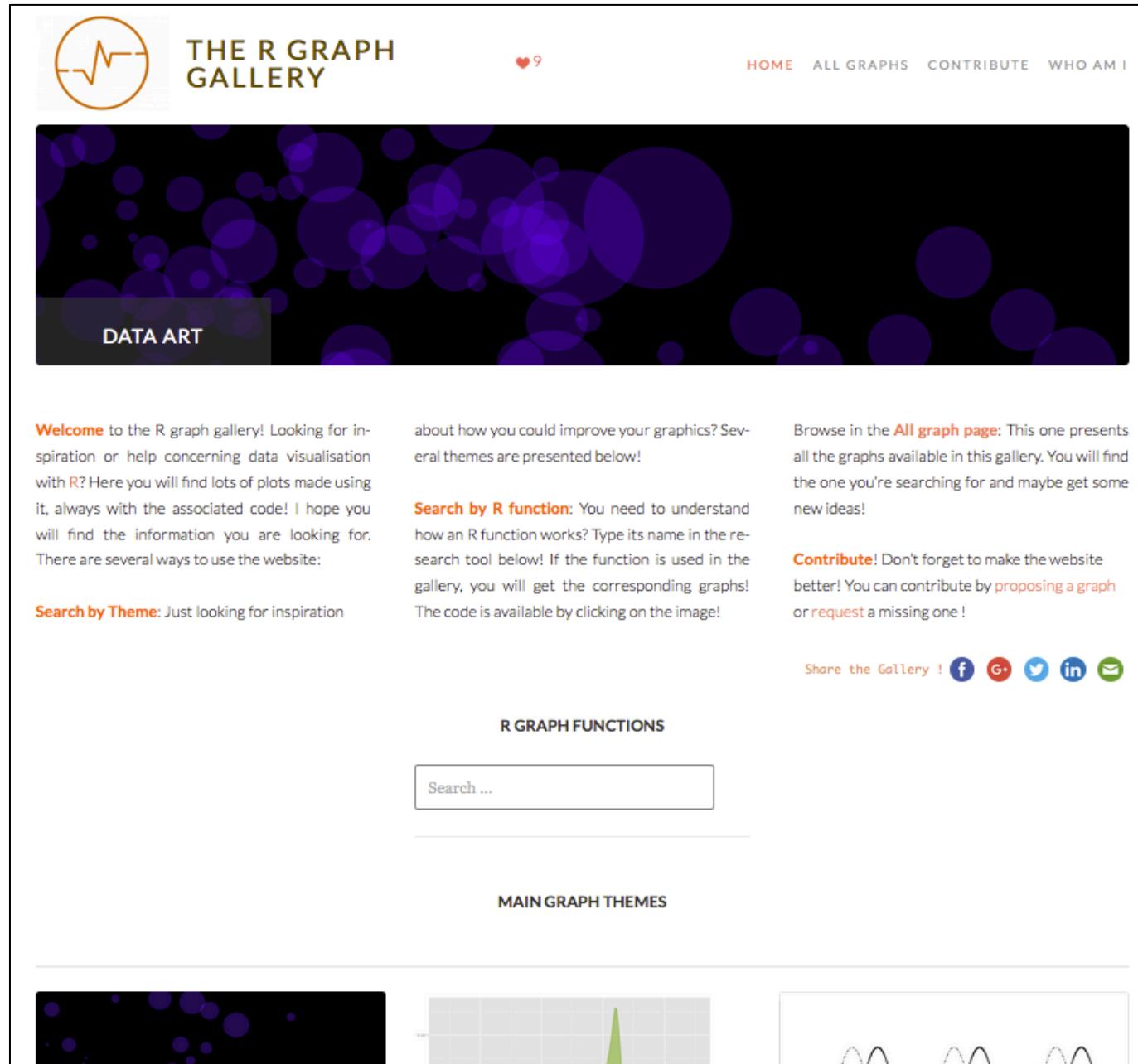
Choose maps!

 CIRAD  S2  S4  S5  S6  TAMU

## From Dataviz to DataArt



# Welcome page of the gallery

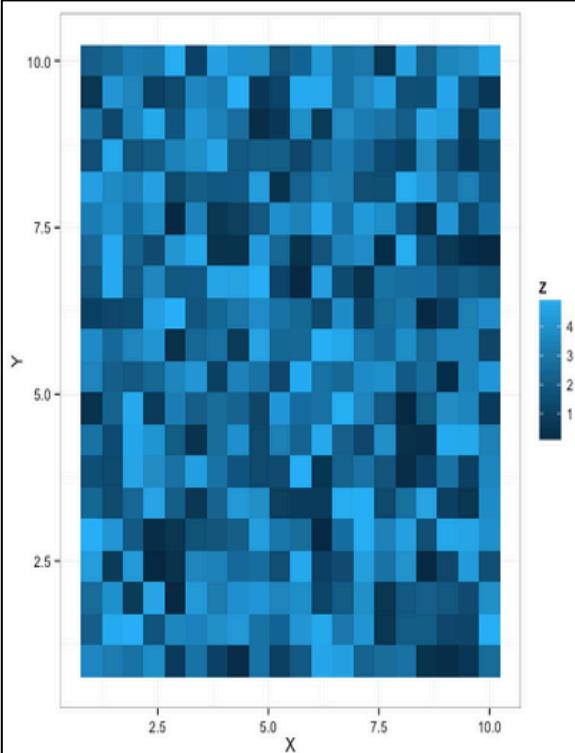


The screenshot shows the homepage of The R Graph Gallery. At the top left is a logo of a yellow circle containing a stylized orange line graph. To its right is the text "THE R GRAPH GALLERY". In the top right corner are links for "HOME", "ALL GRAPHS", "CONTRIBUTE", and "WHO AM I". A small red heart icon with the number "9" is positioned between the logo and the top navigation bar. Below the header is a large, dark purple circular graphic. On the left side of this graphic, there is a black rectangular overlay with the white text "DATA ART". The main content area contains several paragraphs of text. One paragraph welcomes visitors to the gallery and mentions using R for data visualization. Another paragraph discusses improving graphics through themes. A third paragraph explains how to search by R function. A fourth paragraph encourages contribution. At the bottom of the page is a search bar labeled "Search ...", followed by sections for "R GRAPH FUNCTIONS" and "MAIN GRAPH THEMES", each featuring a small preview image.

- >170 charts
- Organized by theme
- Search bar for function or graph type

## Example of a graphic page

- Reproducible code
- Link to relevant libraries, functions and related graphics
- Each graph targets a specific topic



This is a [levelplot](#) made using the `ggplot2` library. Each square represents a value of the input matrix.

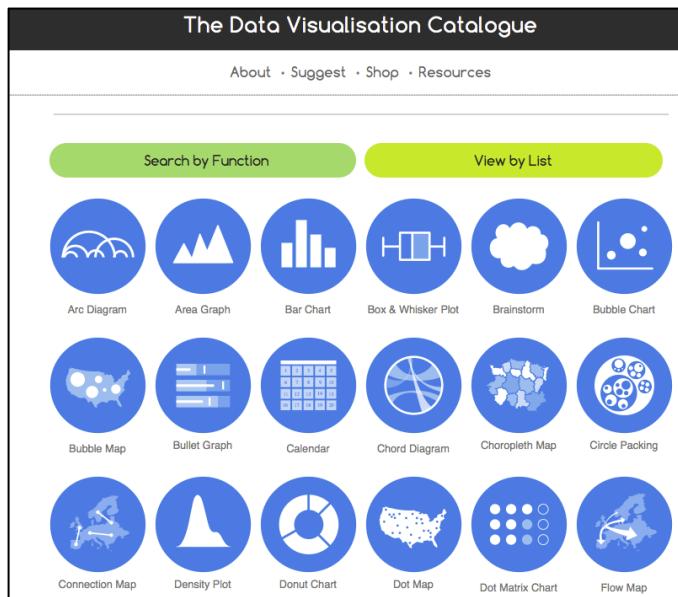
You can also draw levelplot without `ggplot2`. Have a look to [graph #78](#) if you have a square matrix, or to [graph #27](#) if your data are organized in 3 columns !

```
## Example data
x <- seq(1,10, length.out=20)
y <- seq(1,10, length.out=20)
data <- expand.grid(X=x, Y=y)
data$Z <- runif(400, 0, 5)

# Levelplot with ggplot2
library(ggplot2)
ggplot(data, aes(X, Y, z= Z)) + geom_tile(aes(fill = Z)) + theme_bw()

# To change the color of the gradation :
ggplot(data, aes(X, Y, z= Z)) + geom_tile(aes(fill = Z)) +
  theme_bw() +
  scale_fill_gradient(low="white", high="blue")
```

## Other resources



<http://www.datavizcatalogue.com/>

## R graph gallery

The blog is a collection of script examples with example data and output plots. R produce excellent quality graphs for data analysis, science and business presentation, publications and other purposes. Self-help codes and examples are provided. Enjoy nice graphs !!



2d (1) 3 variable plots (5) 3D plots (8) arch (1) area (1) association plot (4) bar (1) barchart (13) bean plot (1) beeswarm (1) binomial (1) biplot (1) box-percentile (2) box-whisker plot (1) boxplot (10) bubble plot (5) calendar (1) categorical data (6) centipede plot (1) circle (2) circular (1) cluster (4) color (2) colour (1) combination plot (10) contour (1) cross bar (1) cumulative (1) curve (3) dendrogram (3) density (13) diagram (2) distribution (9) dotplot (1) dot plot (1) double axis (1) ellipse (2) error bar (6) factor plot (3) fluctuation diagram (1) google (1) grid plot (1) heatmap (20) hexbin plot (1) histogram (11) hive (1) kernel density (4) ladder plot (2) large data points (4) level plot (1) line plot (3) line range (1)

<http://rgraphgallery.blogspot.fr/>



<https://d3js.org/>



# The R Graph Gallery

Rencontres R, Toulouse, June 2016

Yan Holtz, [holtz@supagro.fr](mailto:holtz@supagro.fr)

DataViz is a key step in data science

Dataviz is not trivial

R = amazing graphing tool

Get inspired & contribute!



# Lightning talks

*Yan Holtz, Centre international d'études supérieures  
en sciences agronomiques*



*Géraud DUGE de BERNONVILLE, Valtech*

Cinquièmes Rencontres R



Toulouse  
du 22 au 24 juin 2016



# Lightning talks

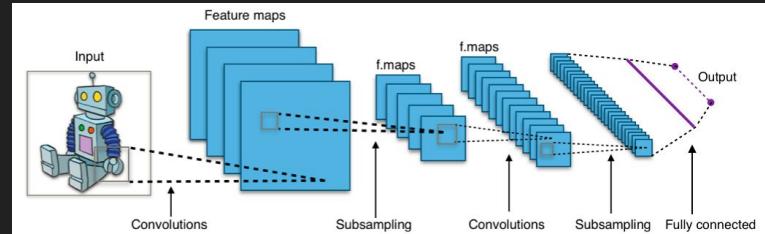
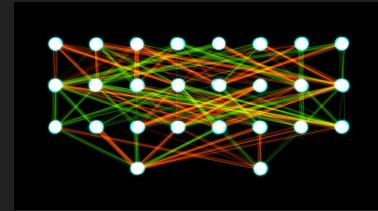
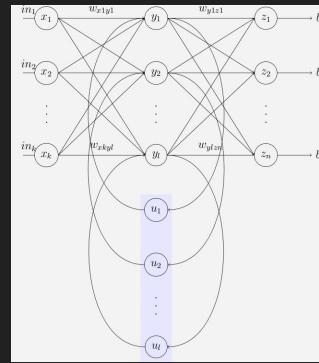
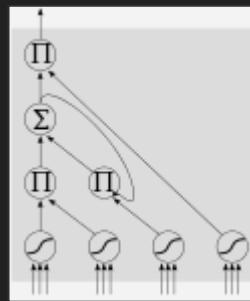
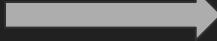
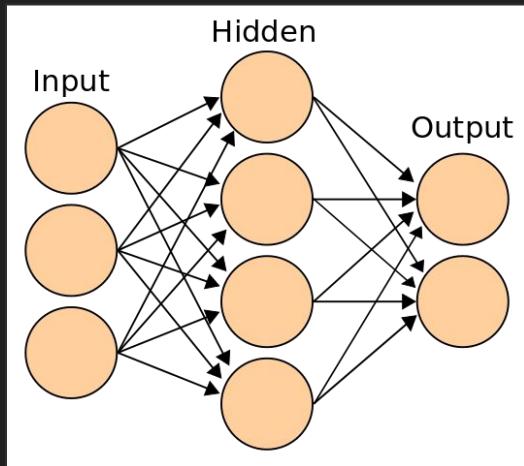
**Deep Learning avec R et H2O**

*Géraud DUGE de BERNONVILLE, Valtech*

# Deep learning avec R et H2O

Géraud Dugé de Bernonville  
@geraudster

# Deep Learning Origins



# Utilisation

Régression

Classification

Détection d'anomalie

Détection d'objet

Traitement du langage

Feature extraction

Réduction de dimensions

...

Analyse statistique  
+ Machine Learning  
+ Distribué  
+ Open source  
= H2O



# Mise en oeuvre @Drivendata.org



# C'est parti

```
h2o.init(min_mem_size = '5G', nthreads = 4)
```

# Data

```
trainset <- h2o.uploadFile('trainset_values.csv')

summary(trainset$status_group)

status_group
  functional          :32259
  non functional      :22824
  functional needs repair: 4317
```

# Tentative 1

```
h2o.deeplearning(predictors, 'status_group', trainset)
```

Score:  
0.7801  
Rank:  
259/1665

# Paramètres

Hidden

Epochs

L1

L2

Activation

Dropout ratio

....



# Grid

```
h2o.grid('deeplearning', x = predictors, y = 'status_group',
          training_frame = trainset,
          hyper_params = list(
              hidden = list(rep(100,2), rep(200,2), rep(300,2), ...),
              activation = c('Rectifier','RectifierWithDropout'),
              l1 = c(0, 1e-5)))
```

Score: 0.7931  
Rank: 234/1665

# Et aussi dans H2O

Autoencoder, Variable Importance

PCA, K-means, Linear models

Gradient Boosting, Random Forests

Et aussi !

Scalabilité (Hadoop, Spark)

H2O Flow

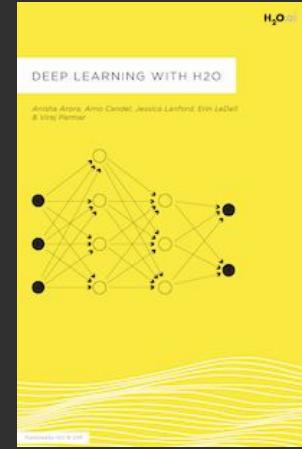
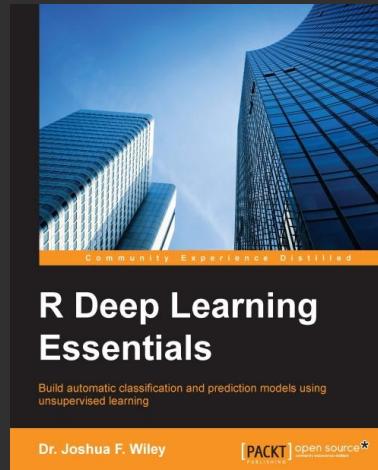
Export de modèles Java

...

# En savoir plus...

<http://h2o.ai>  
R Deep Learning Essentials

@geraudster



Cinquièmes Rencontres R

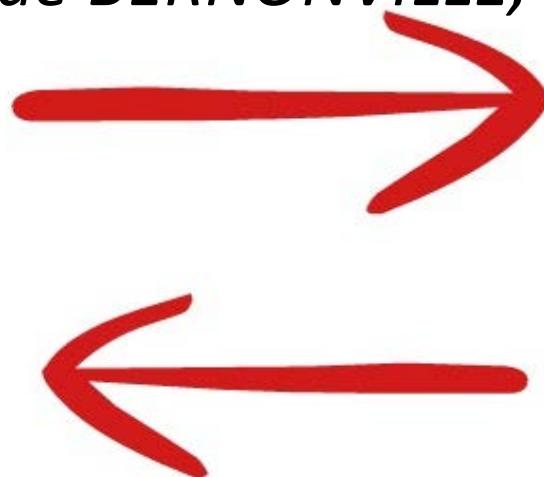


Toulouse  
du 22 au 24 juin 2016



# Lightning talks

*Géraud DUGE de BERNONVILLE, Valtech*



*Nicolas Turenne, laboratoire interdisciplinaire  
science innovation société*

Cinquièmes Rencontres R



Toulouse  
du 22 au 24 juin 2016



# Lightning talks

**Groupe de Travail « Analyse des données  
textuelles sous R »**

*Nicolas Turenne, laboratoire interdisciplinaire  
science innovation société*

# Groupe d'échange Text Data Analytics

---

Nicolas Turenne

Rencontres R – Toulouse – 22-24 Juin 2016



# Groupe d'échange Text Data Analytics

---

Nicolas Turenne

Rencontres R – Toulouse – 22-24 Juin 2016



Cet ouvrage est un guide complet pour l'analyse de données textuelles. Il s'appuie sur un ensemble de bibliothèques géré par le langage R, logiciel libre de traitement des données et d'analyse statistiques.

Didactique, *Analyse de données textuelles sous R* présente les étapes préalables d'opérations de base comme le chargement des données, le découpage en tokens ou la conversion en matrice terme-document. Il détaille également les tâches plus complexes comme l'association des segments de discours à des locuteurs d'un entretien, l'extraction et la visualisation des thèmes, la classification des mots, l'indexation et la recherche des documents ou l'extraction des relations entre entités nommées. Cet ensemble d'opérations doit pouvoir s'intégrer dans un écosystème de plateformes d'analyse comme un système de recommandation, d'aide à la traduction ou d'analyse des médias sociaux.

#### L'auteur

Docteur en informatique, Nicolas Turenne est chercheur à l'INRA au sein du Laboratoire Interdisciplinaire Sciences Innovation Sociétés à l'université de Paris-Est. Il est spécialiste en extraction et gestion de connaissances à partir de textes en utilisant des modèles stochastiques et relationnels.

ISTE  
ditions



Nicolas Turenne

COLLECTION SCIENCES COGNITIVES

# Analyse de données textuelles sous R

Analyse de données textuelles sous R

Nicolas Turenne



ISTE  
ditions

ISTE  
ditions

Cet ouvrage est un guide complet pour l'analyse de données textuelles. Il s'appuie sur un ensemble de bibliothèques géré par le langage R, logiciel libre de traitement des données et d'analyse statistiques.

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ISTE  
ditions



Nicolas Turenne

Analyse de données textuelles sous R

COLLECTION SCIENCES COGNITIVES

# Analyse de données textuelles sous R

Nicolas Turenne



ISTE

ISTE  
ditions

Nom	Thème	Maintenance	Contact
DeducerText koRpus	interface graphique qui utilise tm indices de lisibilité d'un corpus	Ian Fellows m.eik michalke	<ian@fellstat.com> <meik.michalke@hhu.de>
LanguageR	modèles de langage	R. H. Baayen	<harald.baayen@uni-tuebingen.de>
maptpx	model selection for latent topics in text	Matt Taddy	taddy@chicagobooth.edu
maxent	classification de textes	Timothy P. Jurka	<tpjurka@ucdavis.edu>
openNLP qdap	extraction d'entités nommées analyse quantitative du discours	Kurt Hornik Tyler Rinker	<Kurt.Hornik@R-project.org> <tyler.rinker at gmail.com>
RcmdrPlugin.temis	plug-in à R commander; extraction de cooccurrences; classifications de termes	Milan Bouchet-Valat	<nalimilan@club.fr>
RTextTools	apprentissage automatique pour la classification automatique	Timothy P. Jurka	<tpjurka at ucdavis.edu>
smdc	similarité entre documents	Masaaki TAKADA	<tkdmah@gmail.com>
stm	structural topic model	Brandon Stewart	<a href="mailto:bstewart@fas.harvard.edu">bstewart@fas.harvard.edu</a>
stringdist	similarité entre chaînes	Mark van der Loo	<mark.vanderloo@gmail.com>
textcat	catégorisation de documents par n-grammes	Kurt Hornik	<Kurt.Hornik@R-project.org>
textir	analyse de sentiment par régression logistique	Matt Taddy	taddy@chicagobooth.edu
textometry	scores de spécificité d'association	Matthieu Decorde	<matthieu.decorde at ens-lyon.fr>
tm	matrice termes documents; cooccurrence de mots	Ingo Feinerer	ingo.feinerer@tuwien.ac.at
tm.plugin.factiva	parsing du format factiva	Milan Bouchet-Valat	<nalimilan@club.fr>
topicmodels	Latent Dirichlet Allocation (LDA) models and Correlated Topics Models (CTM)	Bettina Grün	<Bettina.Gruen at jku.at>
lsa	Latent Semantic Analysis	Fridolin Wild	f.wild@open.ac.uk
twitteR	téléchargement de tweets	Jeff Gentry	<geoffjentry@gmail.com>
wordnet	ontologie lexicale	Kurt Hornik	<Kurt.Hornik@R-project.org>
x-ent	extraction d'entités nommées généraliste	Nicolas Turenne & Tien Phan	<nicolas.inra@yahoo.fr> <phantien84@gmail.com>
zipfR	modèle de distribution de grands nombre d'événements rares; interpolation	Stefan Evert & Marco Baroni	<stefan.evert@uos.de> <marco.baroni@unitn.it>

Nom	Thème	Maintenance	Contact
DeducerText koRpus	interface graphique qui utilise tm indices de lisibilité d'un corpus	Ian Fellows m.eik michalke	<ian@fellstat.com> <meik.michalke@hhu.de>
LanguageR	modèles de langage	R. H. Baayen	<harald.baayen@uni-tuebingen.de>
maptpx	model selection for latent topics in text	Matt Taddy	taddy@chicagobooth.edu
maxent	classification de textes	Timothy P. Jurka	<tpjurka@ucdavis.edu>
openNLP qdap	extraction d'entités nommées analyse quantitative du discours	Kurt Hornik Tyler Rinker	<Kurt.Hornik@R-project.org> <tyler.rinker at gmail.com>
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Damien Gb Paris Membre Ajouté(e) par Nicolas Turenne il y a environ 5 mois

Norbert Tsopze Lycée classique de dschang Membre Ajouté(e) par Nicolas Turenne il y a environ 5 mois

Nico Bayá Sciences Po Membre Ajouté(e) par Nicolas Turenne il y a environ 5 mois

Jorge N Rosy Membre Ajouté(e) par Nicolas Turenne il y a environ 5 mois

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**Comparison of String Distance Algorithms**

To choose an good algorithm for fuzzy string matching and string distances can be tough. In this tutorial I describe and compare various fuzzy string matching algorithms using the R package stringdist.

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**Fridolin Wild** 14 avril · Oxford, Angleterre, Royaume-Uni

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This book introduces Meaningful Purposive Interaction Analysis (MPIA) theory, which combines social network analysis (SNA) with latent semantic analysis (LSA) to help create and analyse a meaningful learning landscape from the digital traces left by a learning community in the co-construction of knowledge. ... Afficher la suite

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**Jessica Tanon**  
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Hi everyone ! Anyone knows a good method to classify a word as leetspeak or not ? Or a scoring method that could help me do that ?

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**Jessica Tanon** I'm just looking for a mathematical method that would be able to say helloworld isn't LP, hello1world123 isn't either, but h3770wor7d is, and I'm really not sure how to approach this...

J'aime · Répondre · 10 mars, 16:44

**Kevin Bretonnel Cohen** Character ngrams.  
J'aime · Répondre · 11 mars, 13:51

**Prateek Pawan**  
7 mars

Anyone know how to extract text data from PDF files and then do the text mining on it?

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**Youya Tralala** <http://stackoverflow.com/.../use-r-to-convert-pdf-files...>

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- Webinaires ?
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