





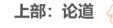
## 工欲善其事、必先利其器

艾新波 / 2018 • 北京



#### 课程体系









第3章 格言联璧话学习

■ 第4章 源于数学、归于工程

中部: 执具



第6章 基础编程

第7章 数据对象









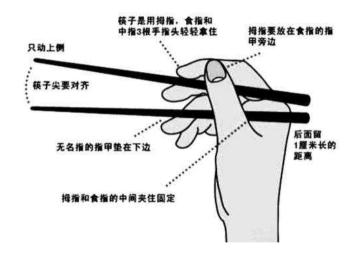
- 🗐 第11章 相随相伴、谓之关联

12章 既是世间法、自当有分别

13章 方以类聚、物以群分

9 第14章 庐山烟雨浙江潮

#### 工欲善其事、必先利其器



筷子,是延伸我们身体最好的工具 几乎人人都达到了"日用而不知"的境界

#### 工欲善其事、必先利其器





#### 代码,是延伸我们思想最好的工具

Everything became much clearer when I started writing code (http://karpathy.github.io/neuralnets)

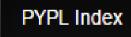
#### 编程语言排行榜



http://www.tiobe.com/tiobe-index/



http://githut.info/



http://pypl.github.io/PYPL.html

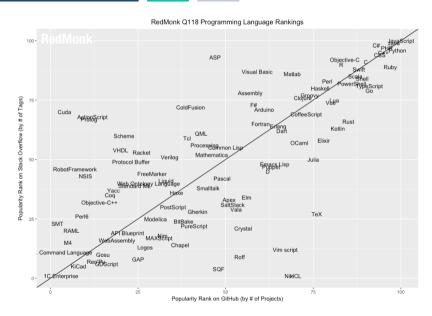


http://spectrum.ieee.org/static/interactive-the-top-programming-languages-2016



http://redmonk.com/sogrady/2017/03/17/language-rankings-1-17/

#### 编程语言排行榜



https://redmonk.com/sogrady/2018/03/07/language-rankings-1-18/

#### 百花齐放, 各有所长

Language Rank Types			Spectrum Ranking		
1.	Python	⊕ 🖵	100.0		
A scripting language that is often used by software developers to add programmability to their applications, such as engineering-analysis tools or animation software.					
2.	С	□ 🖵 🛊	99.7		
3.	Java	$\oplus$ $\Box$ $\Box$	99.4		
4.	C++	□ 🖵 🛊	97.2		
5.	C#		88.6		
6.	R	<b>-</b>	88.1		
Designed for programming statistical analysis and data-mining applications.					
7.	JavaScript		85.5		
8.	PHP	<b>(1)</b>	81.4		
9.	Go	⊕ 🖵	76.1		
10.	Swift		75.3		
11.	Arduino		73.0		
12.	Ruby	⊕ 🖵	72.4		
13.	Assembly		72.1		
14.	Scala	⊕ □	68.3		
15.	Matlab	<b>-</b>	68.0		

A scripting language for MathWorks' Matlab computing environment, Matlab is designed for numerical computing tasks, such as engineering or scientific simulations.

## R和Python:数据科学领域的双子星

领域	双子星		
家用轿车			
超级英雄		**	
快餐消费	McDonald's		
数据科学	R	<b>ę</b> python™	

#### R和Python: 共生而非竞争

#### 1.3.2 Python, Julia, and friends

In this book, you won't learn anything about Python, Julia, or any other programming language useful for data science. This isn't because we think these tools are bad. They're not! And in practice, most data science teams use a mix of languages, often at least R and Python.

However, we strongly believe that it's best to master one tool at a time. You will get better faster if you dive deep, rather than spreading yourself thinly over many topics. This doesn't mean you should only know one thing, just that you'll generally learn faster if you stick to one thing at a time. You should strive to learn new things throughout your career, but make sure your understanding is solid before you move on to the next interesting thing.

We think R is a great place to start your data science journey because it is an environment designed from the ground up to support data science. R is not just a programming language, but it is also an interactive environment for doing data science. To support interaction, R is a much more flexible language than many of its peers. This flexibility comes with its downsides, but the big upside is how easy it is to evolve tailored grammars for specific parts of the data science process. These mini languages help you think about problems as a data scientist, while supporting fluent interaction between your brain and the computer.

http://r4ds.had.co.nz/introduction.html#python-julia-and-friends

#### R和Python: 倚天屠龙

OUR PICKS LATEST POPULAR QUARTZ OBSESSIONS Q ...

URSA LABS

# R and Python are joining forces, in the most ambitious crossover event of the year—for programmers

The more that people using these languages work together, they say, the better it is for data science in general. "I hope it ends the pointless feuding between R and Python," says Wickham. "Both languages are awesome."

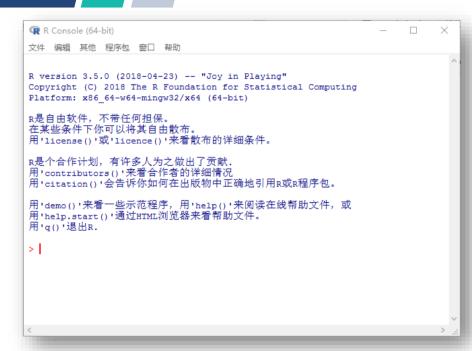
https://qz.com/1270139/r-and-python-are-joining-forces-in-the-most-ambitious-crossover-event-of-the-year-for-programmers/ (Access on May 20, 2018)

#### R语言



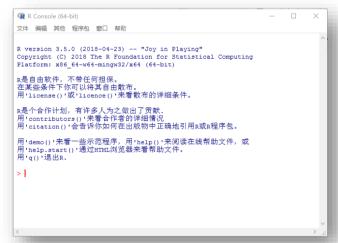
https://www.r-project.org/

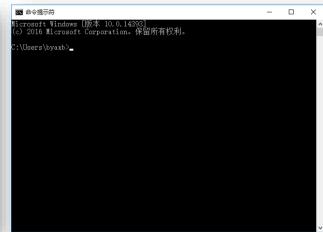
#### 简洁明了的R交互界面





#### 简洁明了的R交互界面

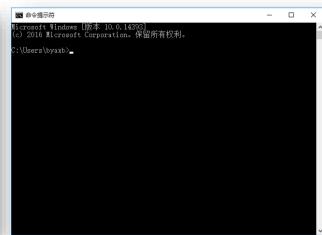




R是如此简约,都快赶上cmd了^-^

#### 简洁明了的R交互界面

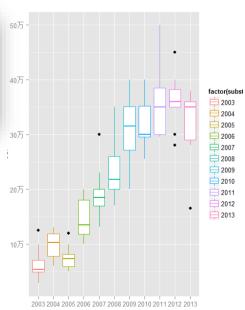


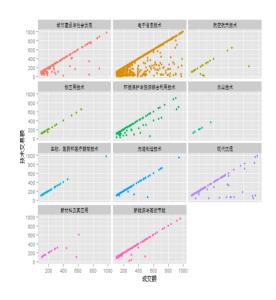


R是如此简约,都快赶上cmd了^-^

#### 简约而不简单: 描述性分析



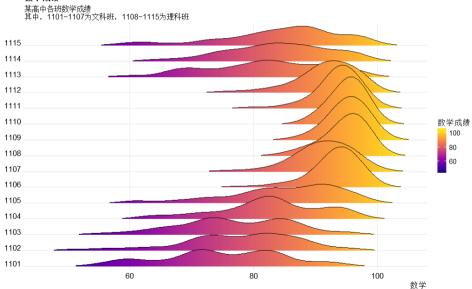




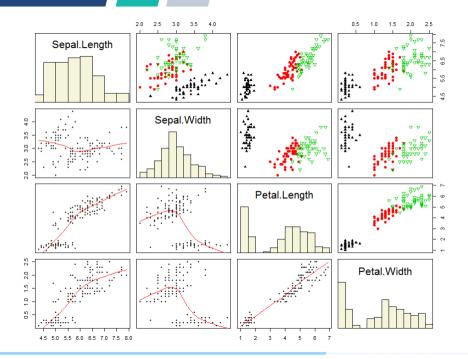
#### 简约而不简单: 描述性分析



#### 数学成绩

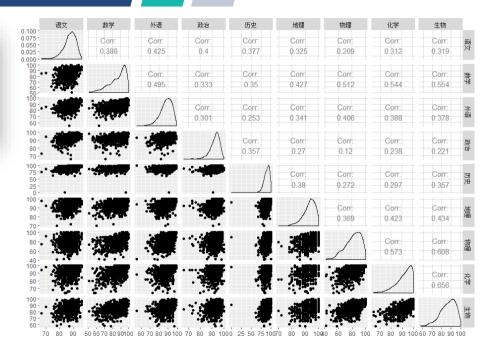


#### 简约而不简单: 相关性分析



#### 简约而不简单: 相关性分析



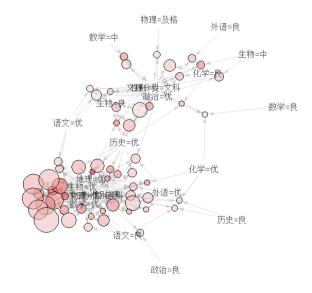


#### 简约而不简单: 关联规则



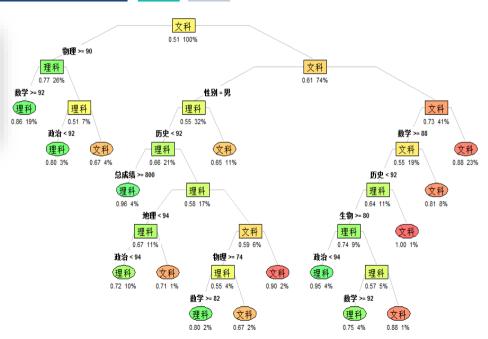
#### Graph for 57 rules

size: support (0.065 - 0.165) color: lift (1.578 - 1.853)



#### 简约而不简单: 决策树

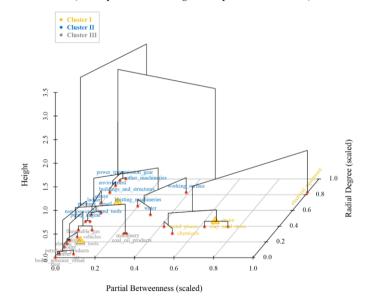




#### 简约而不简单: 层次聚类

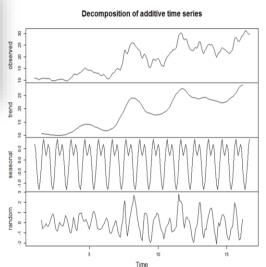


#### Dendrogram of Source Nodes (on the plane of radial degree and partial betweenness)

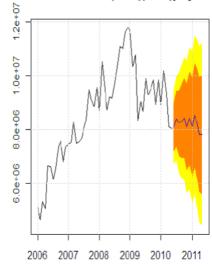


#### 简约而不简单: 时间序列



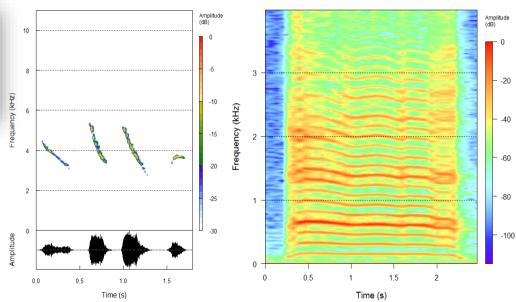


#### Forecasts from ARIMA(1,1,0)(1,0,0)[12]



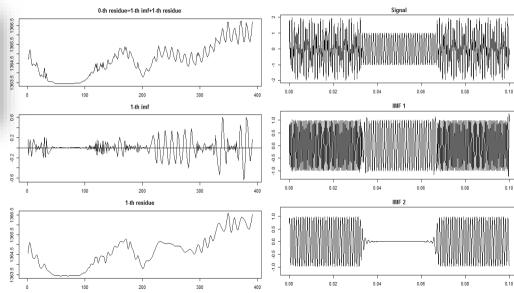
#### 简约而不简单:信号处理





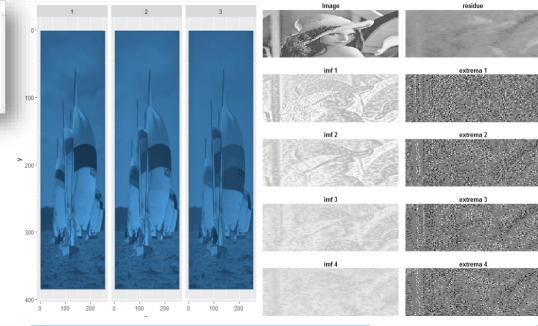
#### 简约而不简单: 信号处理



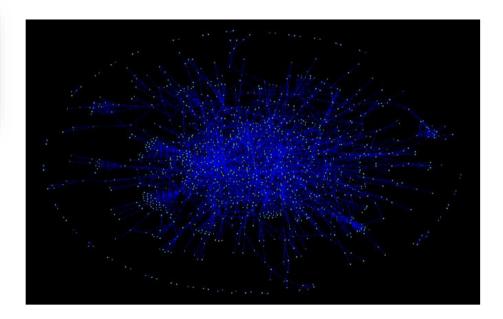


### 简约而不简单: 图像处理



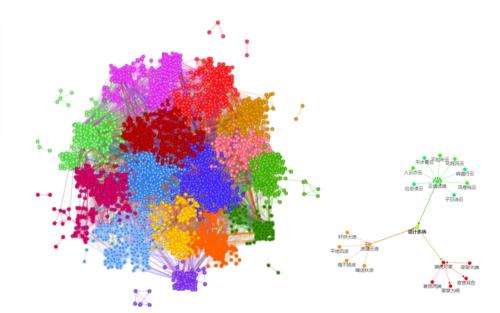


### 简约而不简单: 复杂网络



#### 简约而不简单: 复杂网络



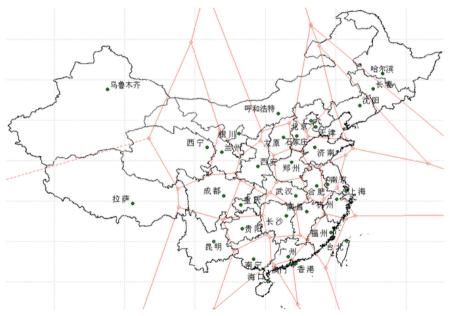


## 简约而不简单:空间数据分析



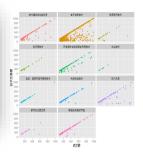
#### Voronoi 最优化的算法

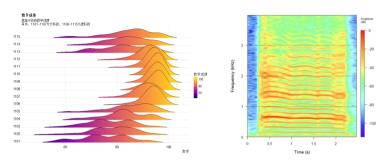


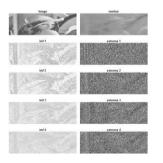


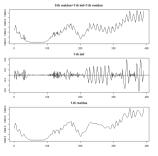
## 简约而不简单: 几乎无所不能

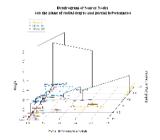


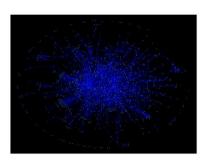










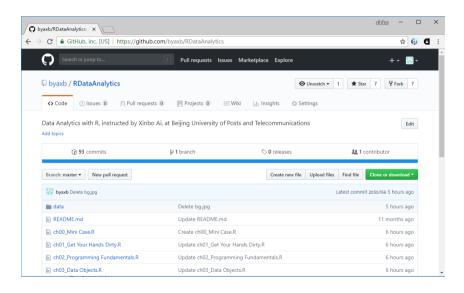


### 简约而不简单: 几乎无所不能



钟情于数据的小伙伴们 一起来学R吧,数据分析是一片广阔的天地那里大有可为

#### **Get Your Hands Dirty**



https://github.com/byaxb/RDataAnalytics

## 謝謝聆听 Thank you

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课程 网址: https://github.com/byaxb/RDataAnalytics



