

科技论文实验数据统计 分析与可视化

张立国

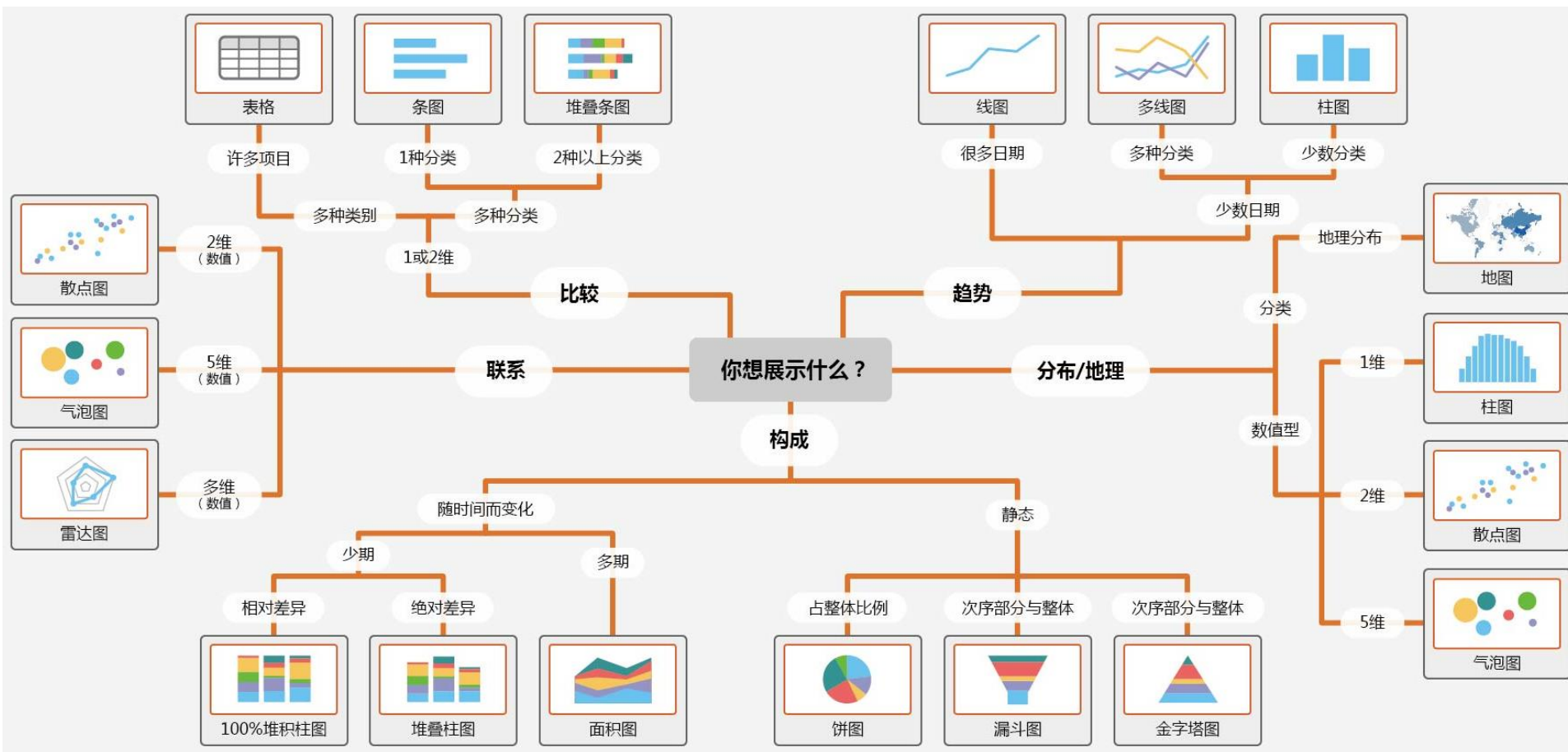


哈尔滨工程大学
Harbin Engineering University

大 工 至 善 · 大 学 至 真

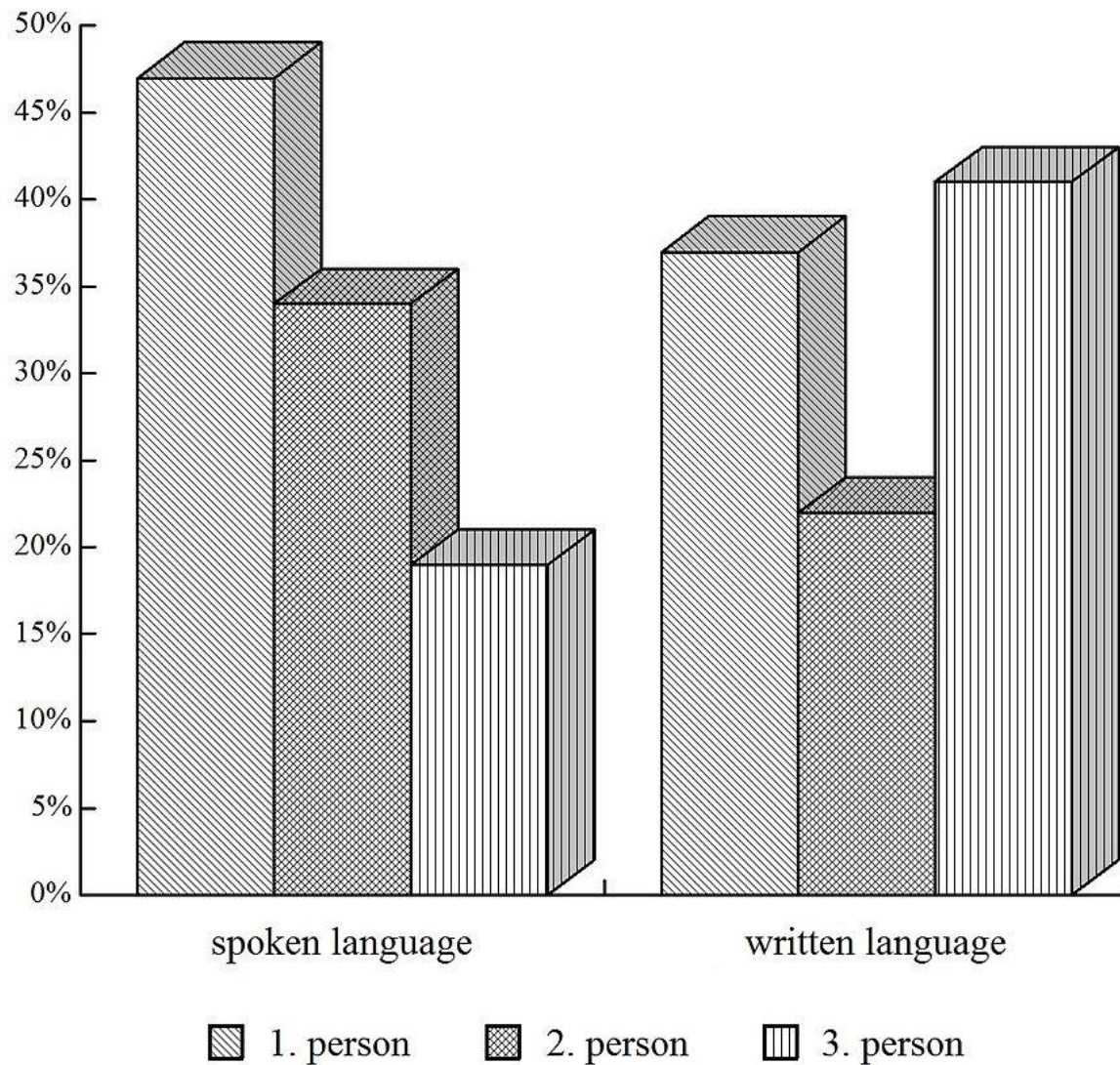
数据可视化

如何选择图表的类型？



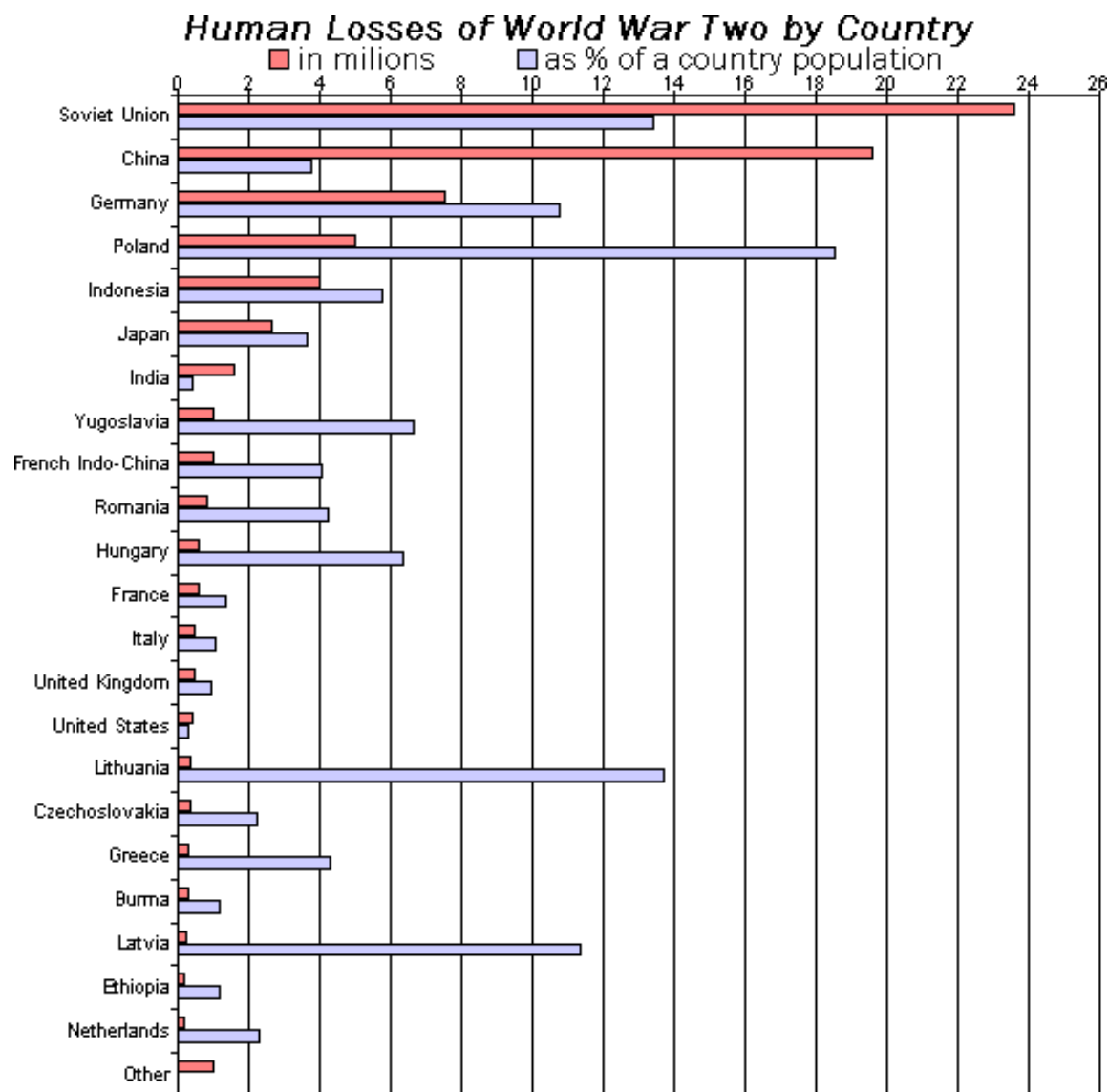
数据可视化

柱状图



数据可视化

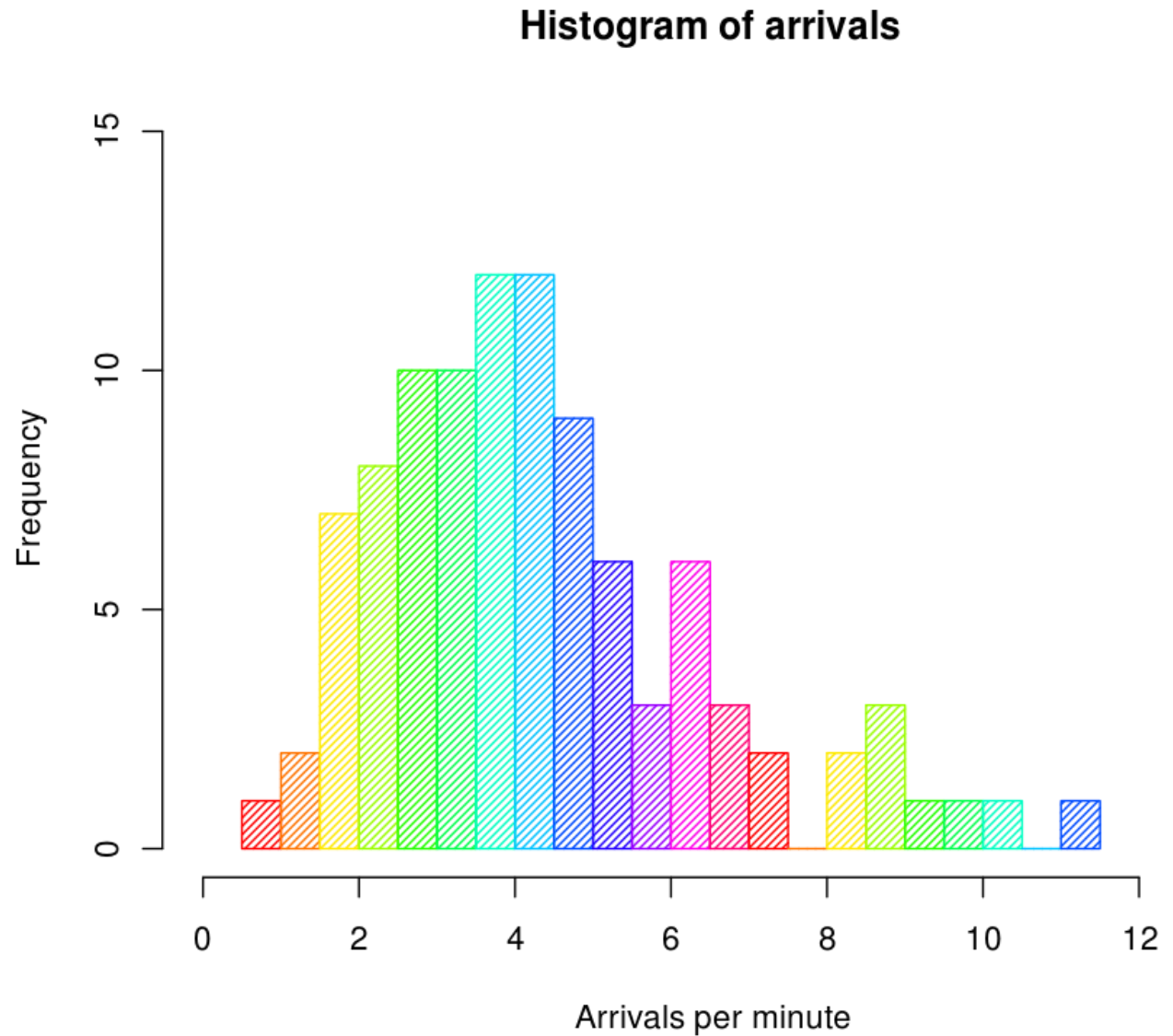
柱状图



数据可视化

直方图

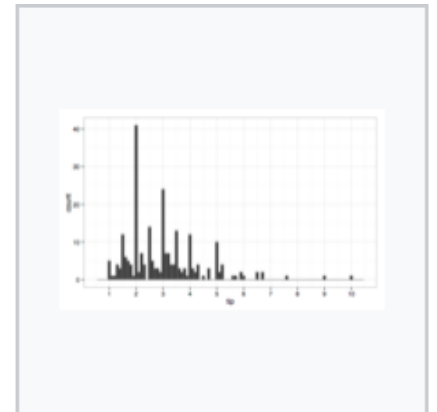
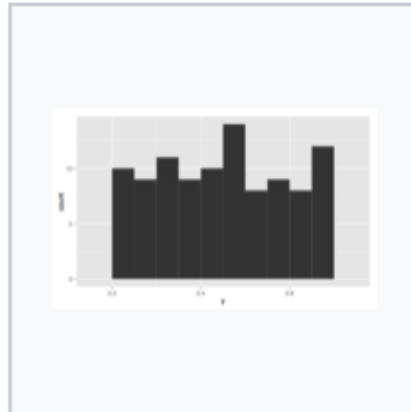
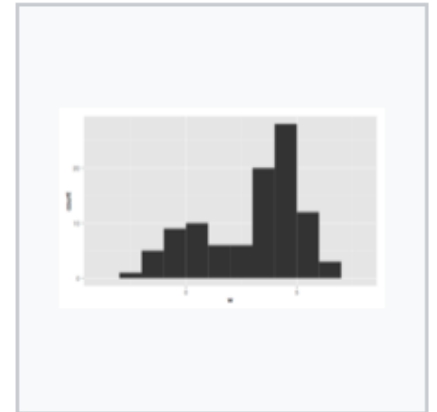
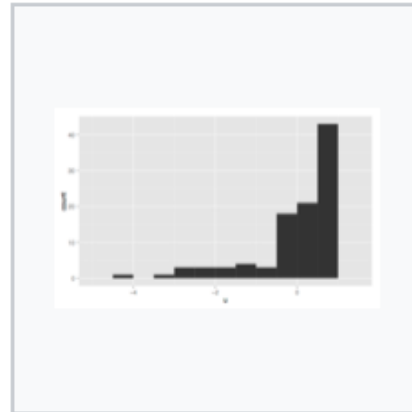
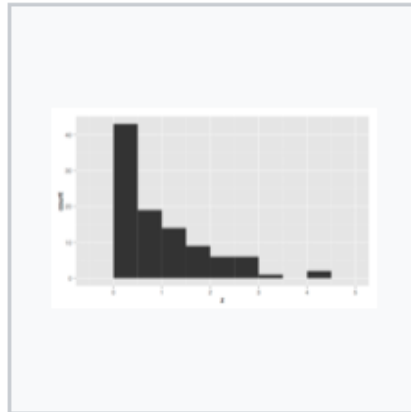
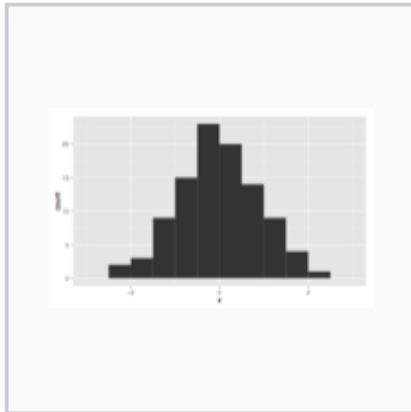
$$n = \sum_{i=1}^k m_i$$



数据可视化

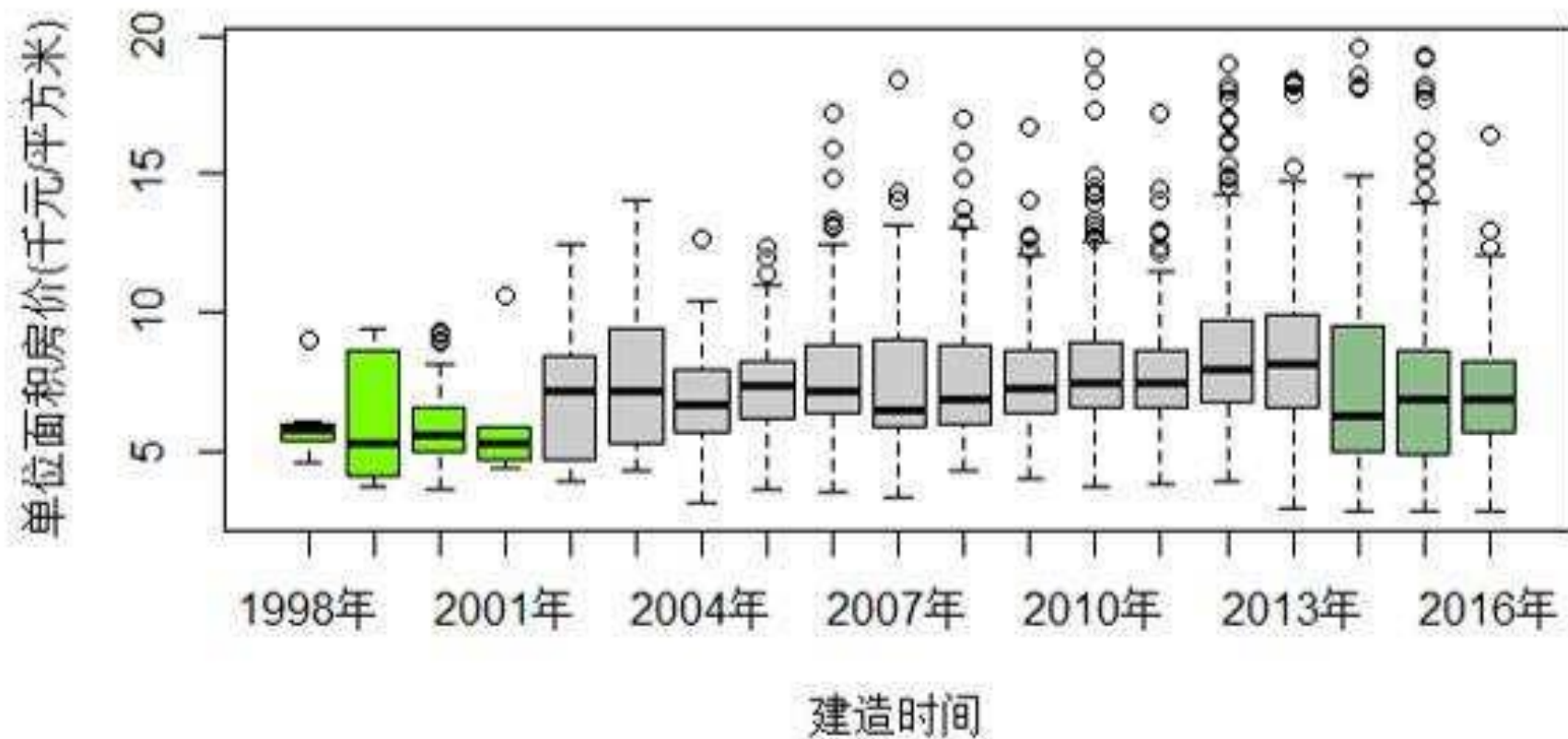
直方图

$$n = \sum_{i=1}^k m_i$$



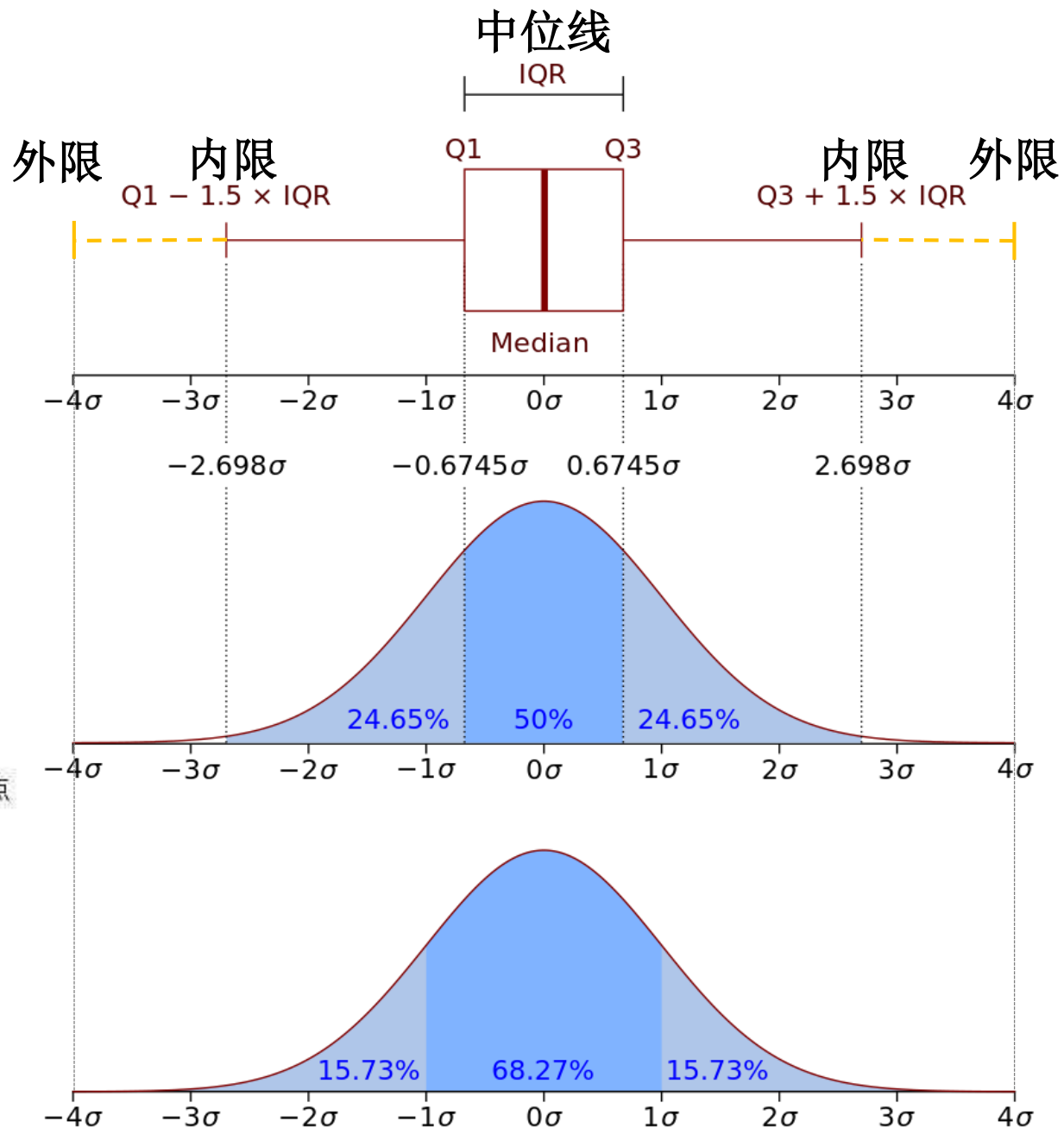
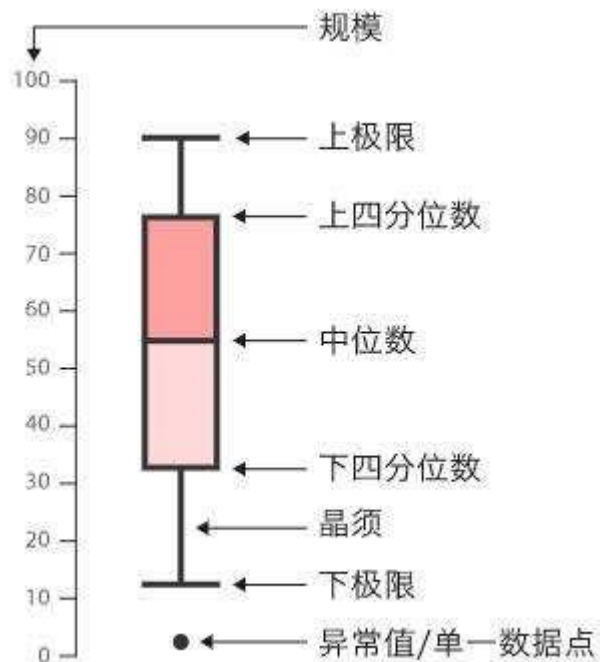
数据可视化

箱线图



数据可视化

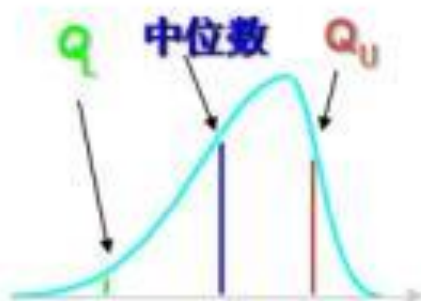
箱线图



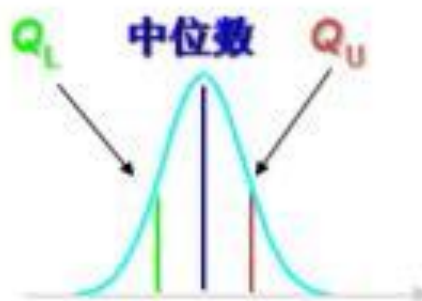
数据可视化

箱线图

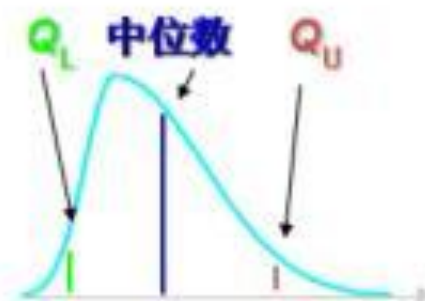
分布的形状与箱线图



左偏分布



对称分布

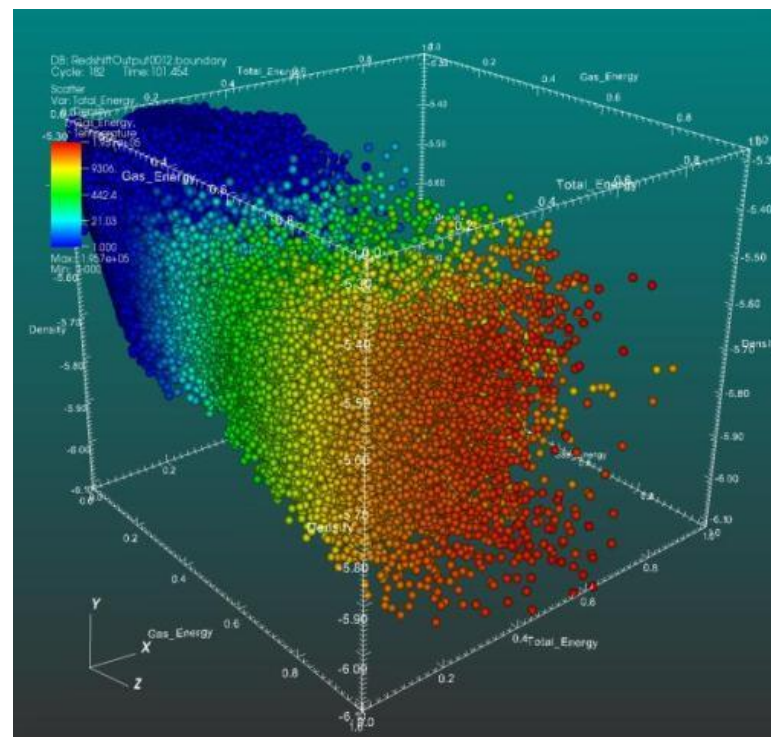
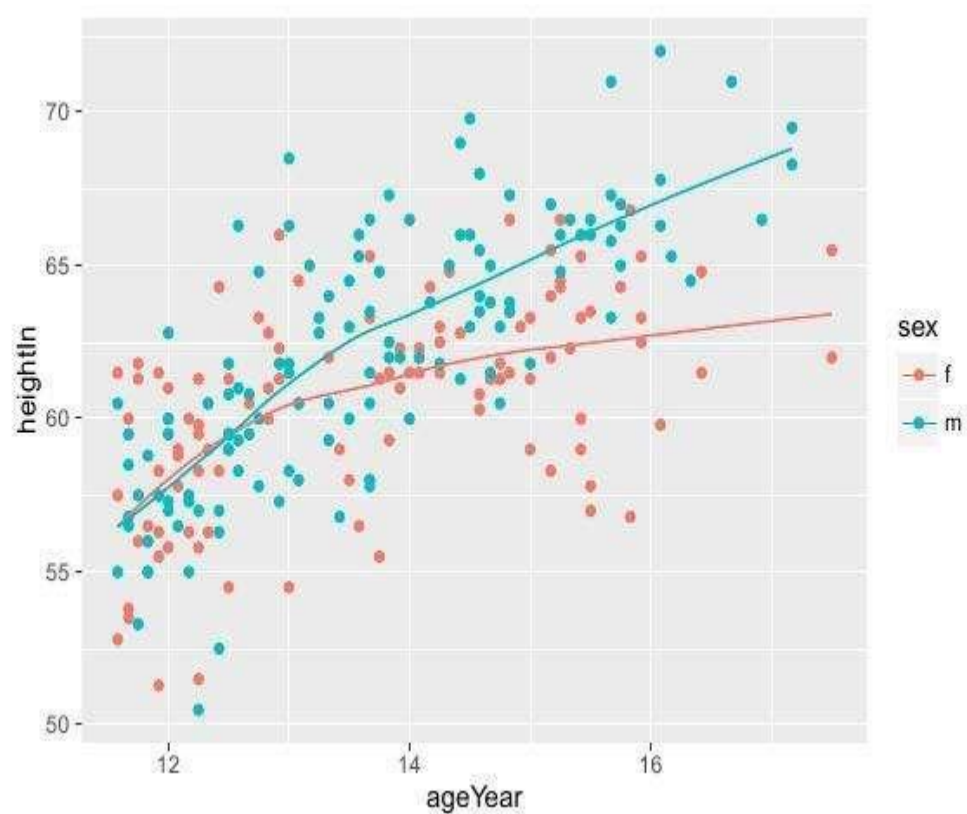


右偏分布

不同分布的箱线图

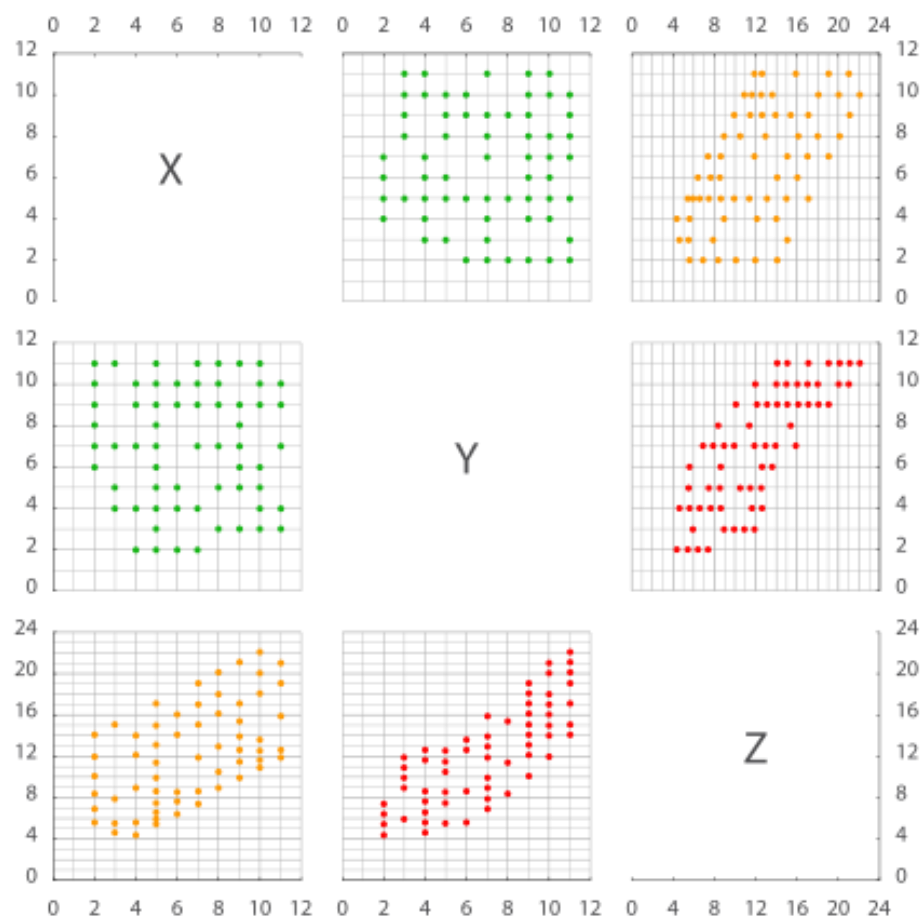
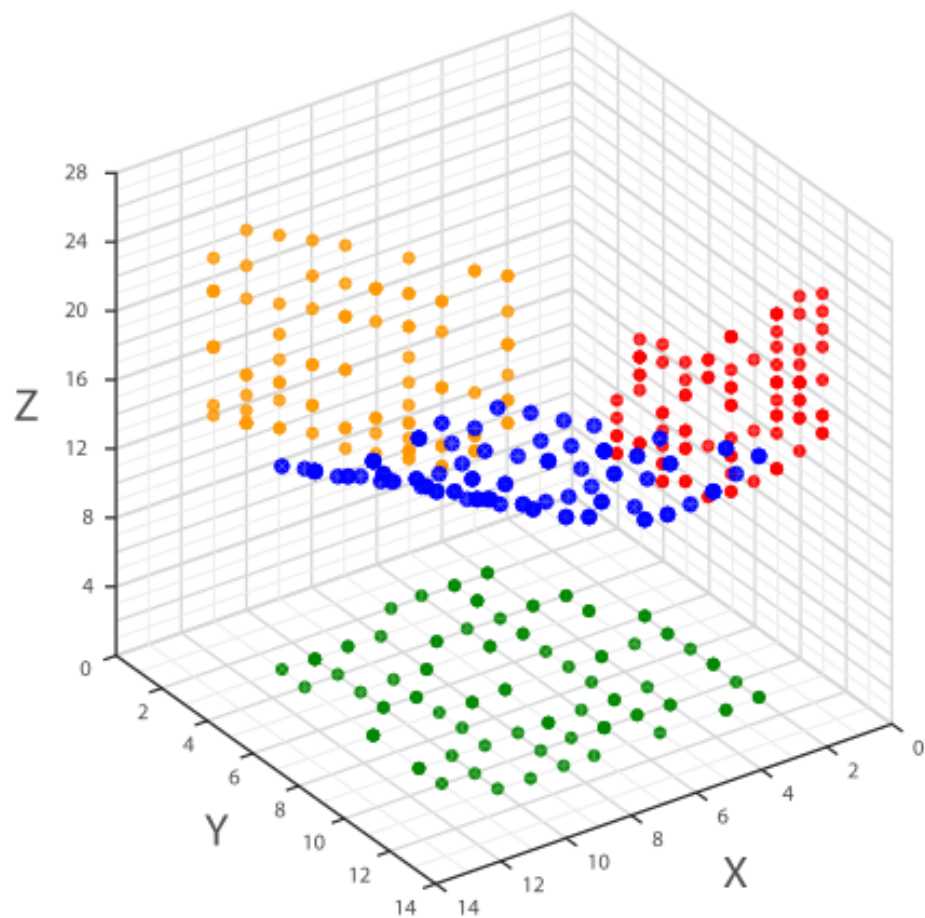
数据可视化

散点图



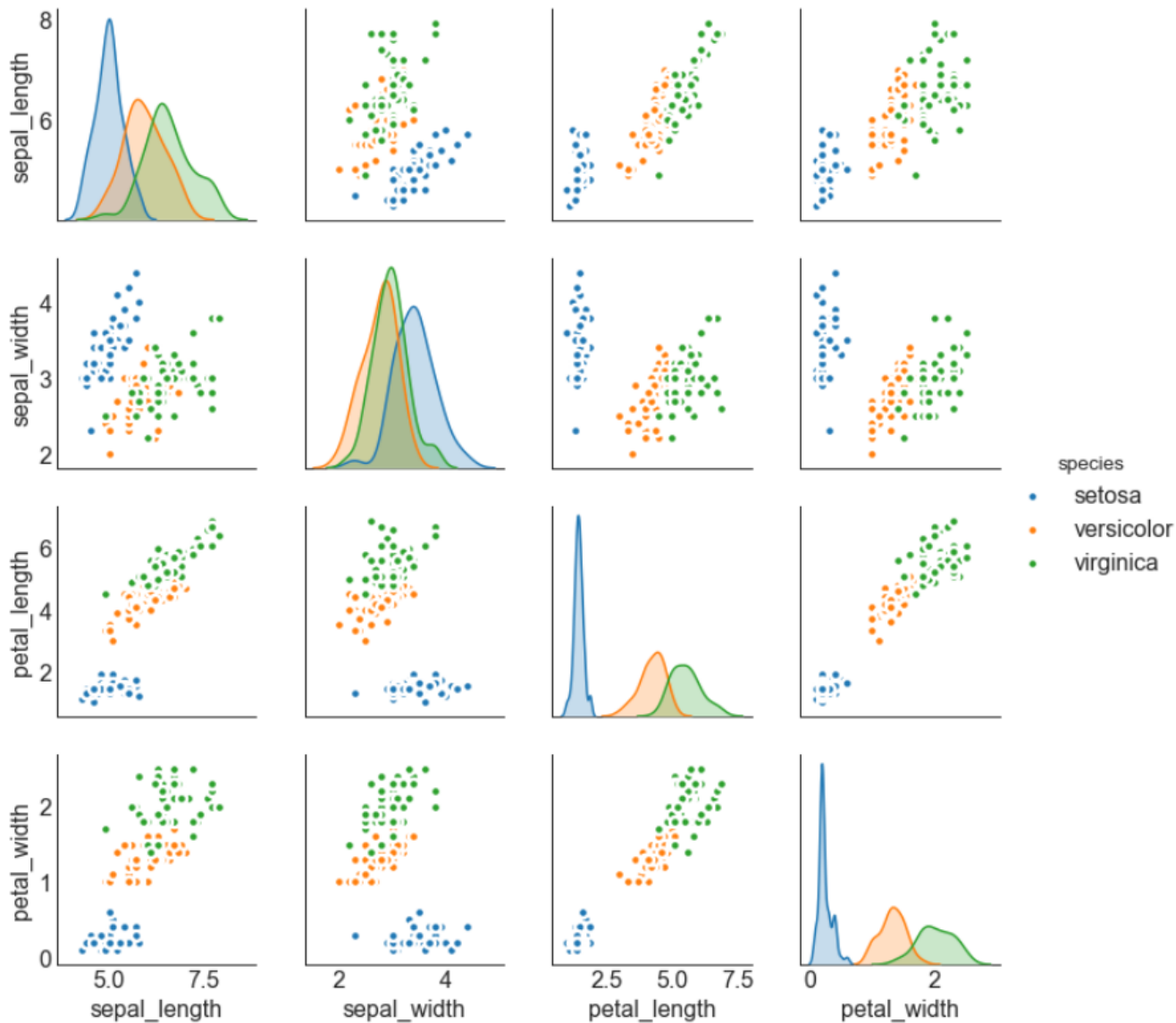
数据可视化

散点图



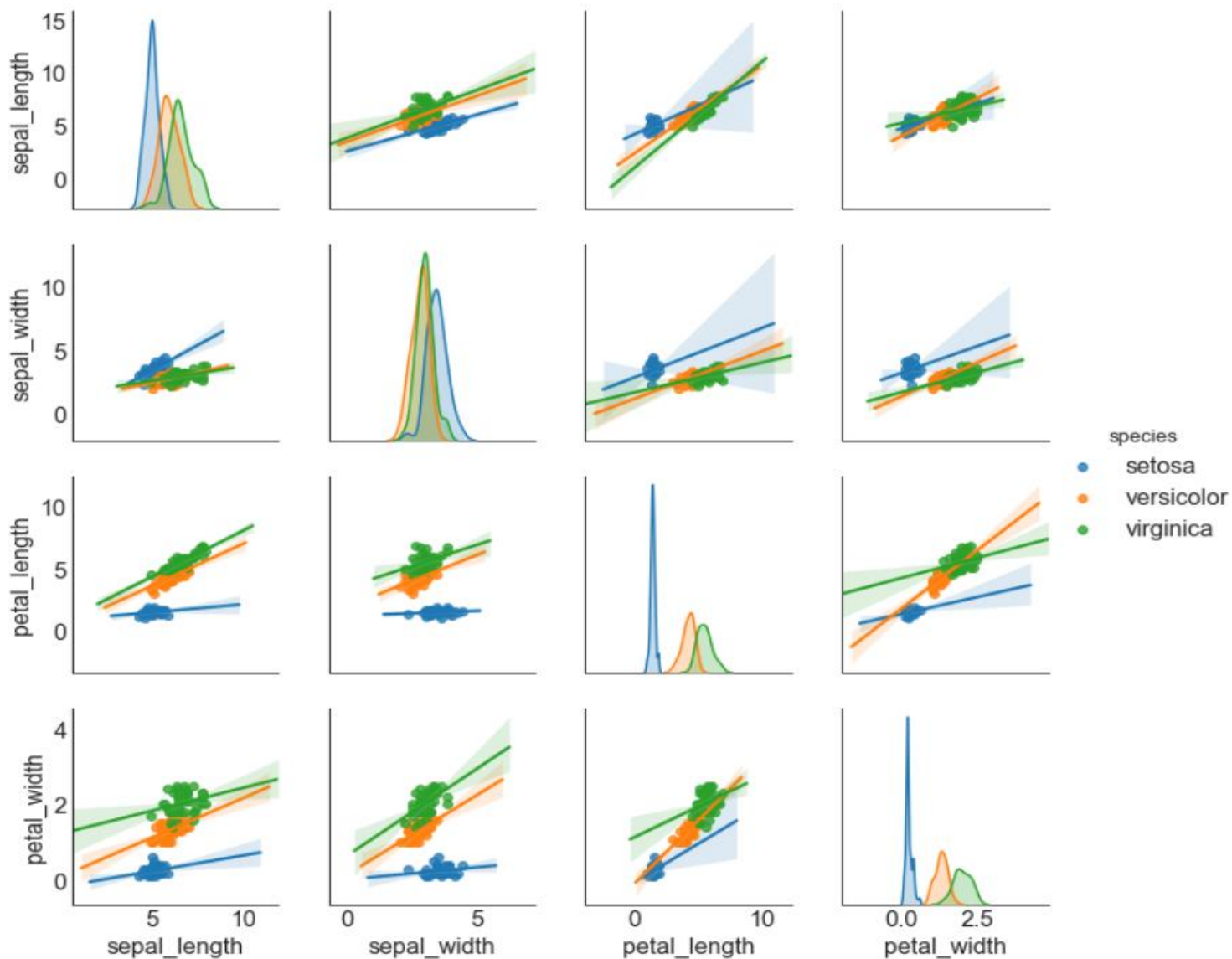
数据可视化

散点图



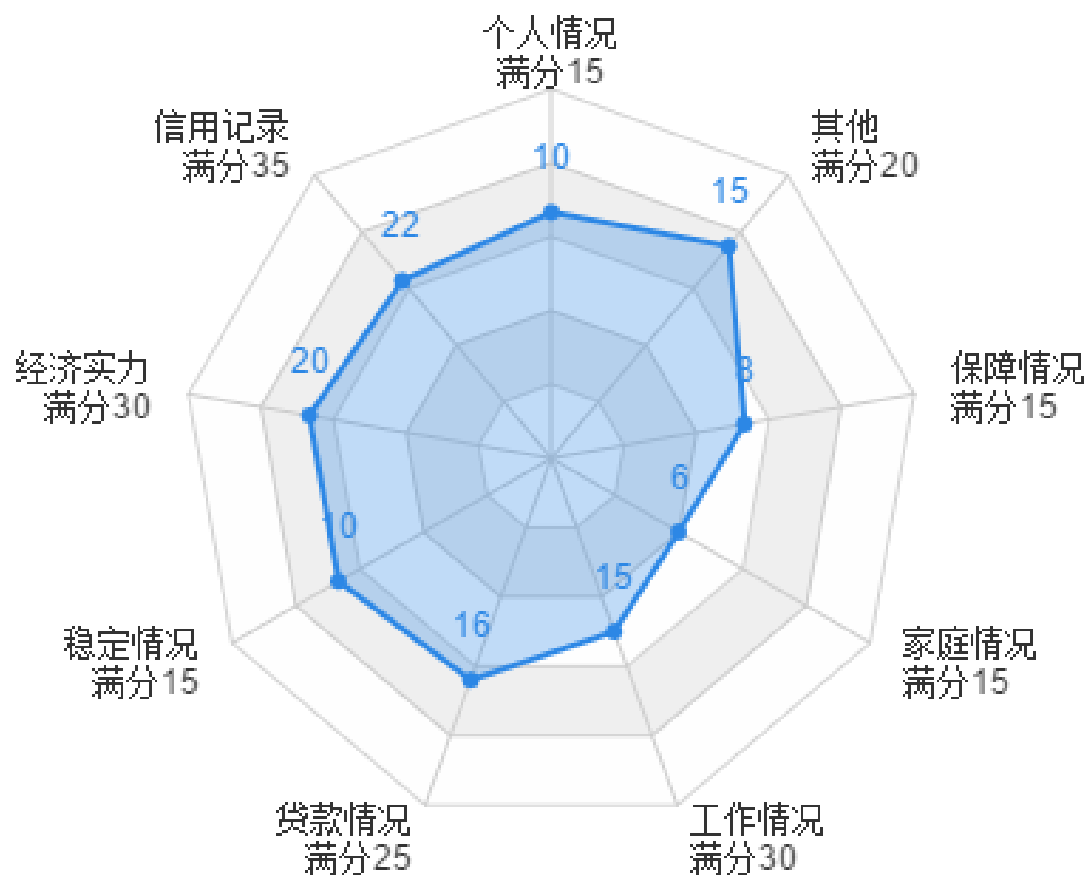
数据可视化

散点图









数据可视化

雷达图



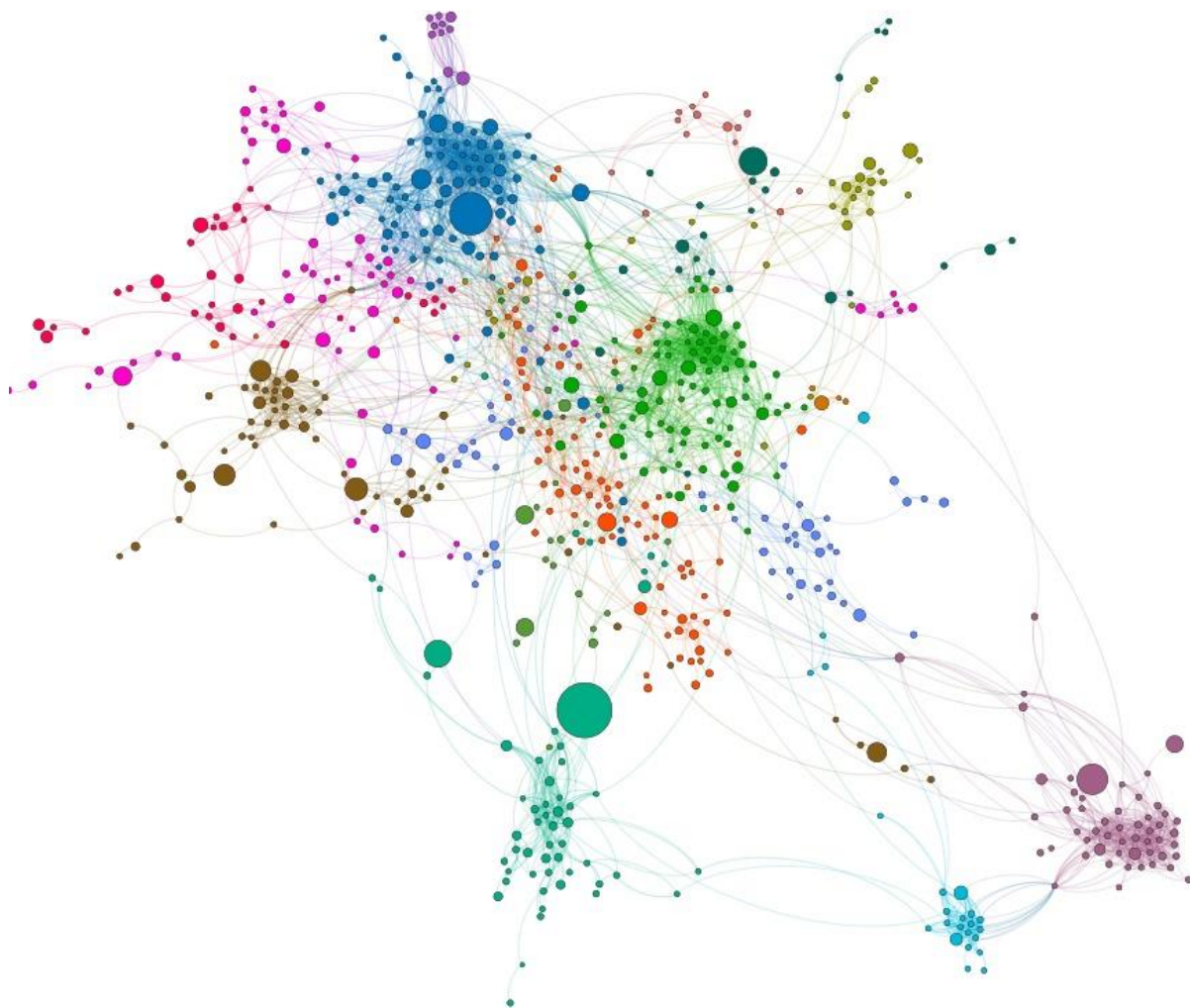
数据可视化

雷达图

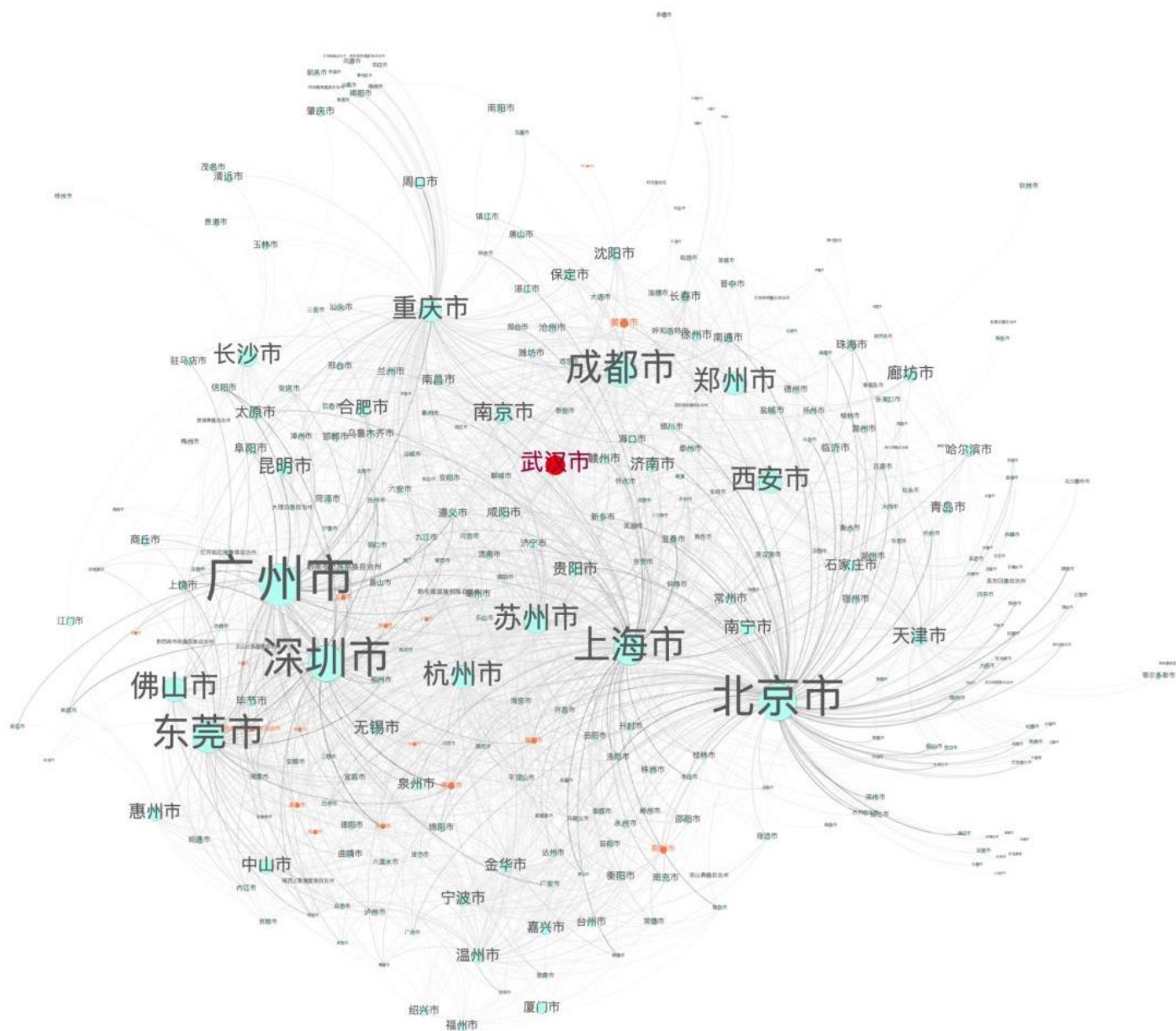
车型信息	<div></div> <div>奥迪Q5L 2020款 40 TFSI 荣享进 取型</div>	<div></div> <div>奔驰GLC 2020款 改款 GLC 260 L 4MATIC 动感型</div>	<div></div> <div>凯迪拉克XT5 2020款 改款 28T 四 驱领先运动型</div>																																																
口碑评分	<div>★★★★★ 4.41分 11人参与</div> <div><table><tr><th>外观</th><th>内饰</th><th>性价比</th><th>油耗</th><th>操控</th><th>动力</th><th>空间</th><th>舒适性</th></tr><tr><td>4.9</td><td>3.8</td><td>4.5</td><td>4.3</td><td>4.3</td><td>4.4</td><td>4.9</td><td>4.4</td></tr></table></div>	外观	内饰	性价比	油耗	操控	动力	空间	舒适性	4.9	3.8	4.5	4.3	4.3	4.4	4.9	4.4	<div>★★★★★ 4.20分 5人参与</div> <div><table><tr><th>外观</th><th>内饰</th><th>性价比</th><th>油耗</th><th>操控</th><th>动力</th><th>空间</th><th>舒适性</th></tr><tr><td>5.0</td><td>4.8</td><td>3.5</td><td>3.1</td><td>4.0</td><td>3.9</td><td>5.0</td><td>4.3</td></tr></table></div>	外观	内饰	性价比	油耗	操控	动力	空间	舒适性	5.0	4.8	3.5	3.1	4.0	3.9	5.0	4.3	<div>★★★★★ 4.25分 5人参与</div> <div><table><tr><th>外观</th><th>内饰</th><th>性价比</th><th>油耗</th><th>操控</th><th>动力</th><th>空间</th><th>舒适性</th></tr><tr><td>5.0</td><td>3.6</td><td>4.7</td><td>3.7</td><td>4.0</td><td>4.4</td><td>4.6</td><td>4.0</td></tr></table></div>	外观	内饰	性价比	油耗	操控	动力	空间	舒适性	5.0	3.6	4.7	3.7	4.0	4.4	4.6	4.0
	外观	内饰	性价比	油耗	操控	动力	空间	舒适性																																											
4.9	3.8	4.5	4.3	4.3	4.4	4.9	4.4																																												
外观	内饰	性价比	油耗	操控	动力	空间	舒适性																																												
5.0	4.8	3.5	3.1	4.0	3.9	5.0	4.3																																												
外观	内饰	性价比	油耗	操控	动力	空间	舒适性																																												
5.0	3.6	4.7	3.7	4.0	4.4	4.6	4.0																																												

数据可视化

网络图

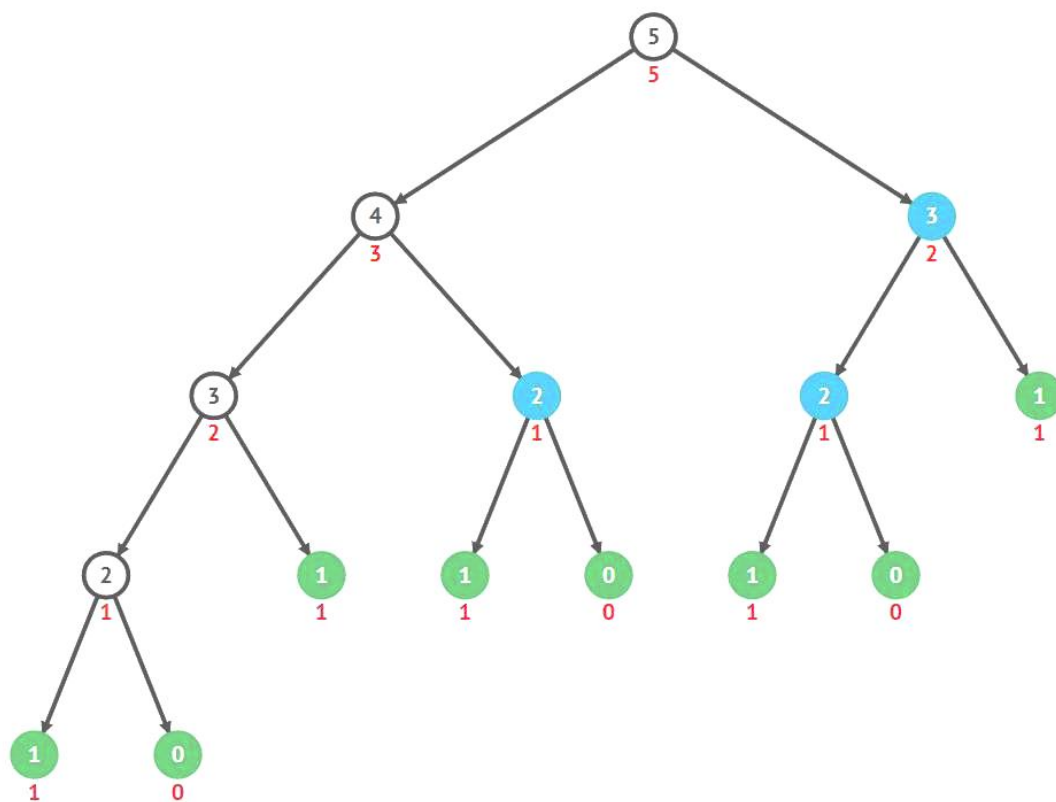


网络图



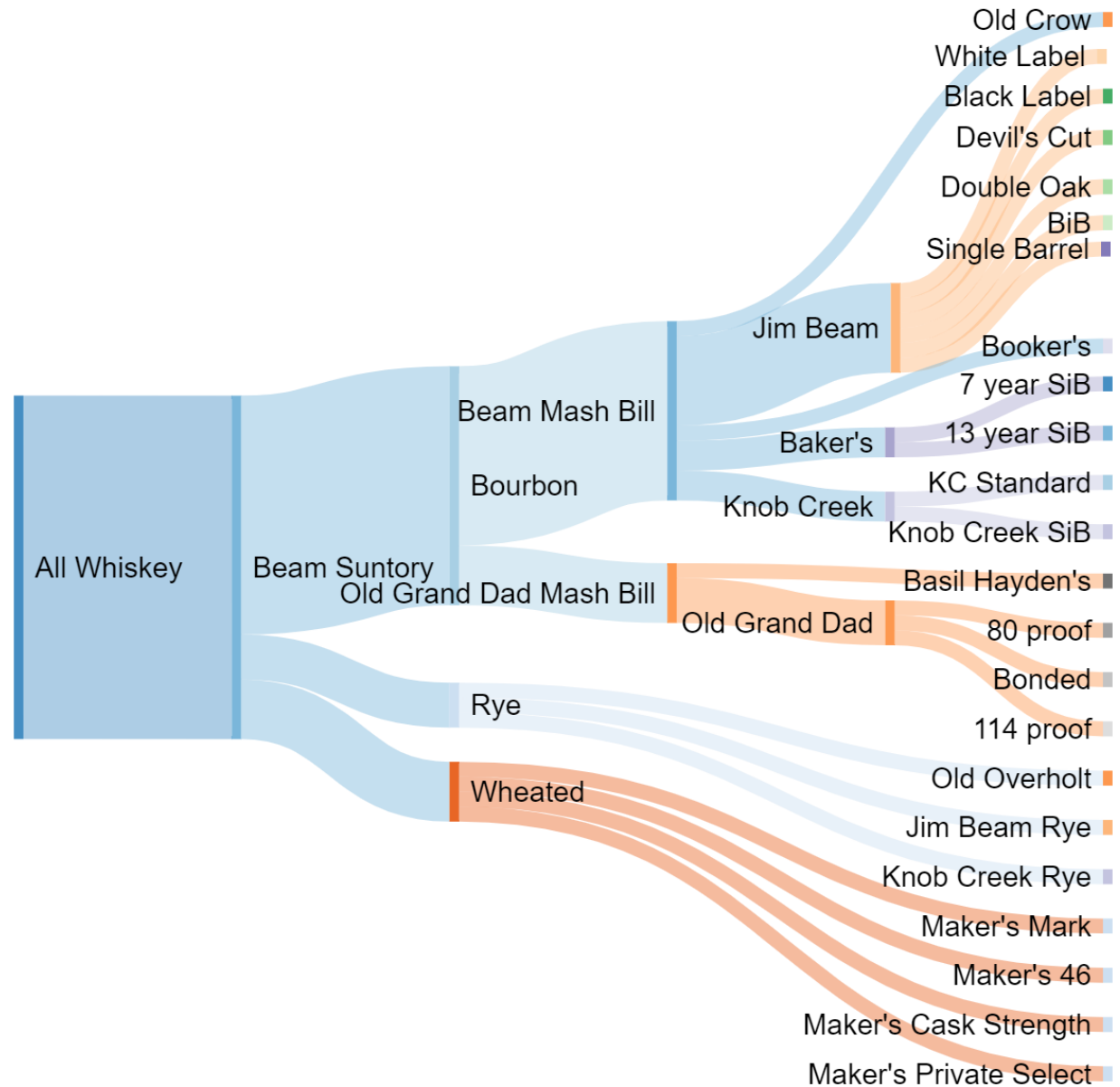
数据可视化

树状图



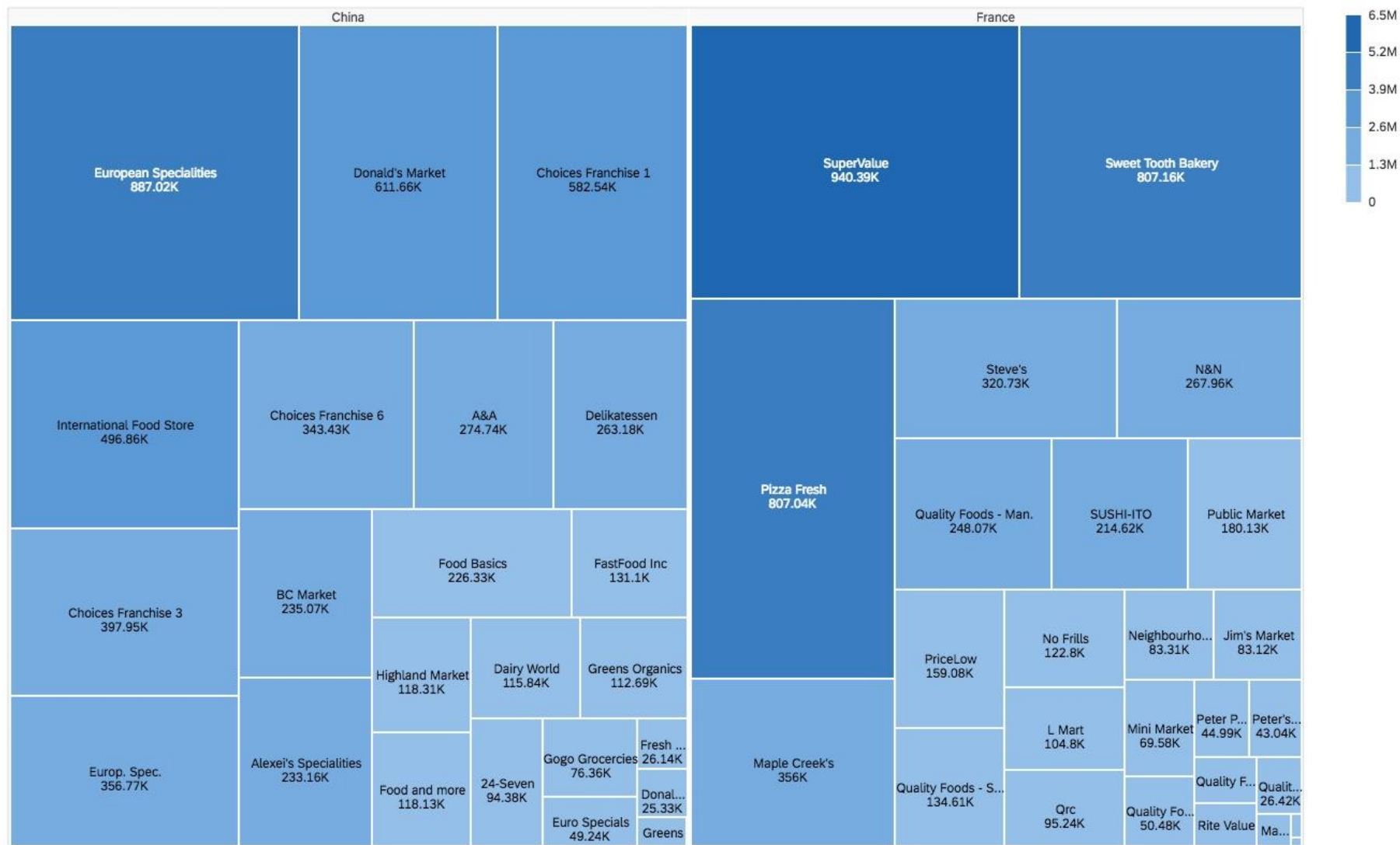
数据可视化

树状图



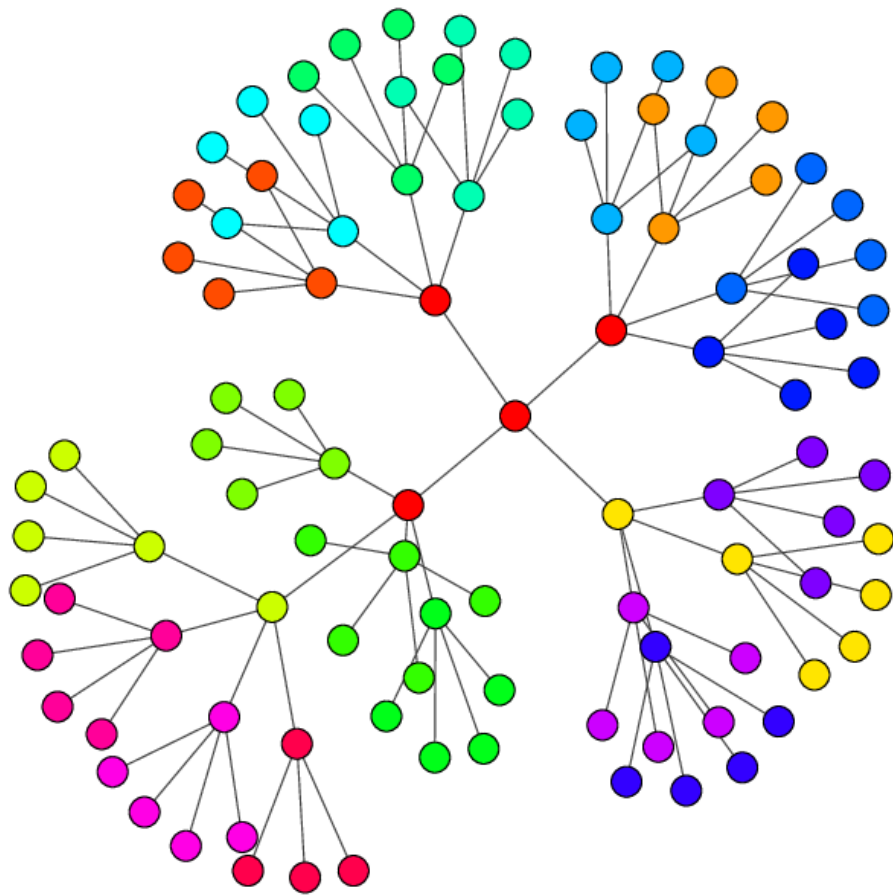
数据可视化

树状图



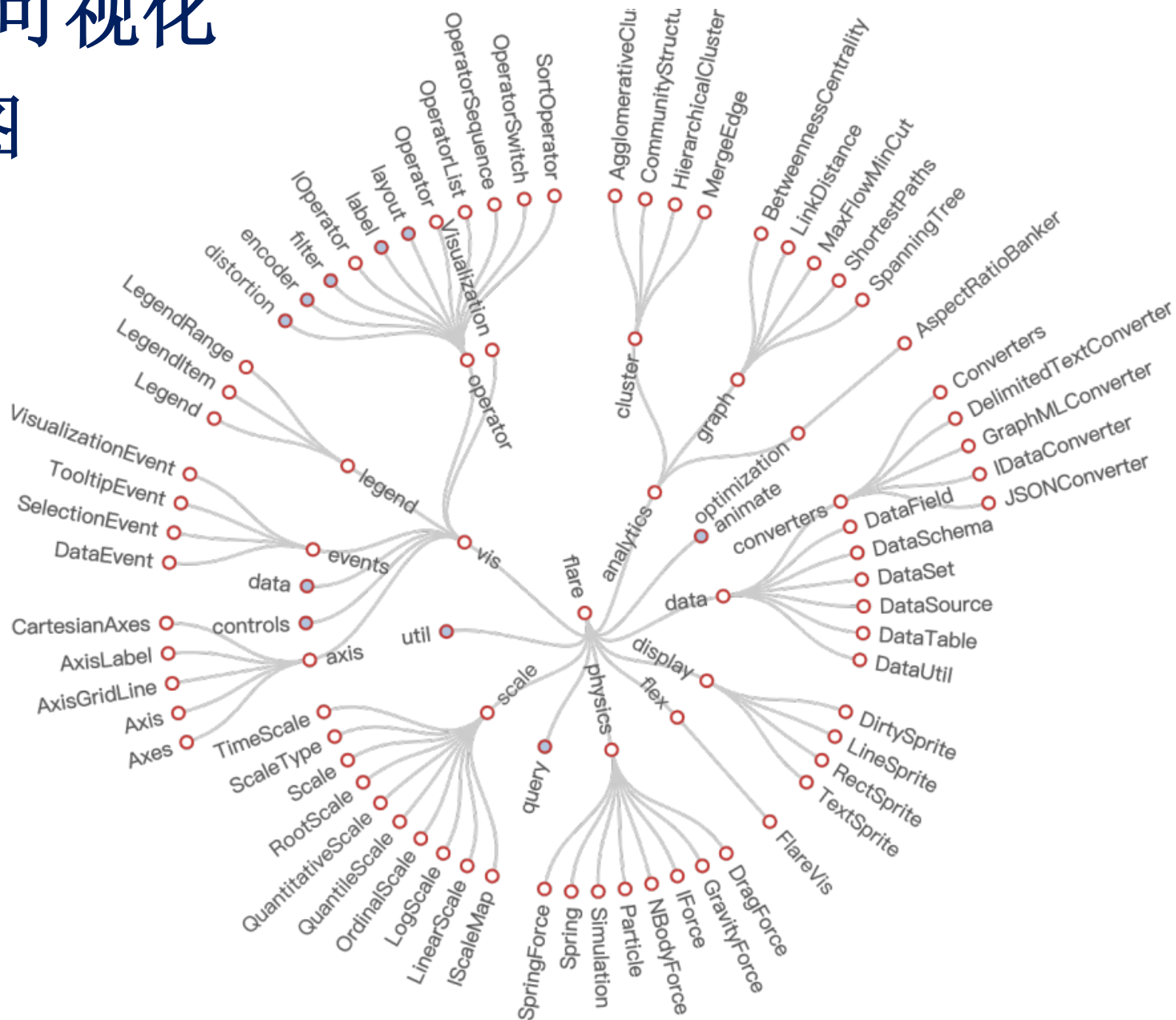
数据可视化

树状图



数据可视化

树状图



数据可视化

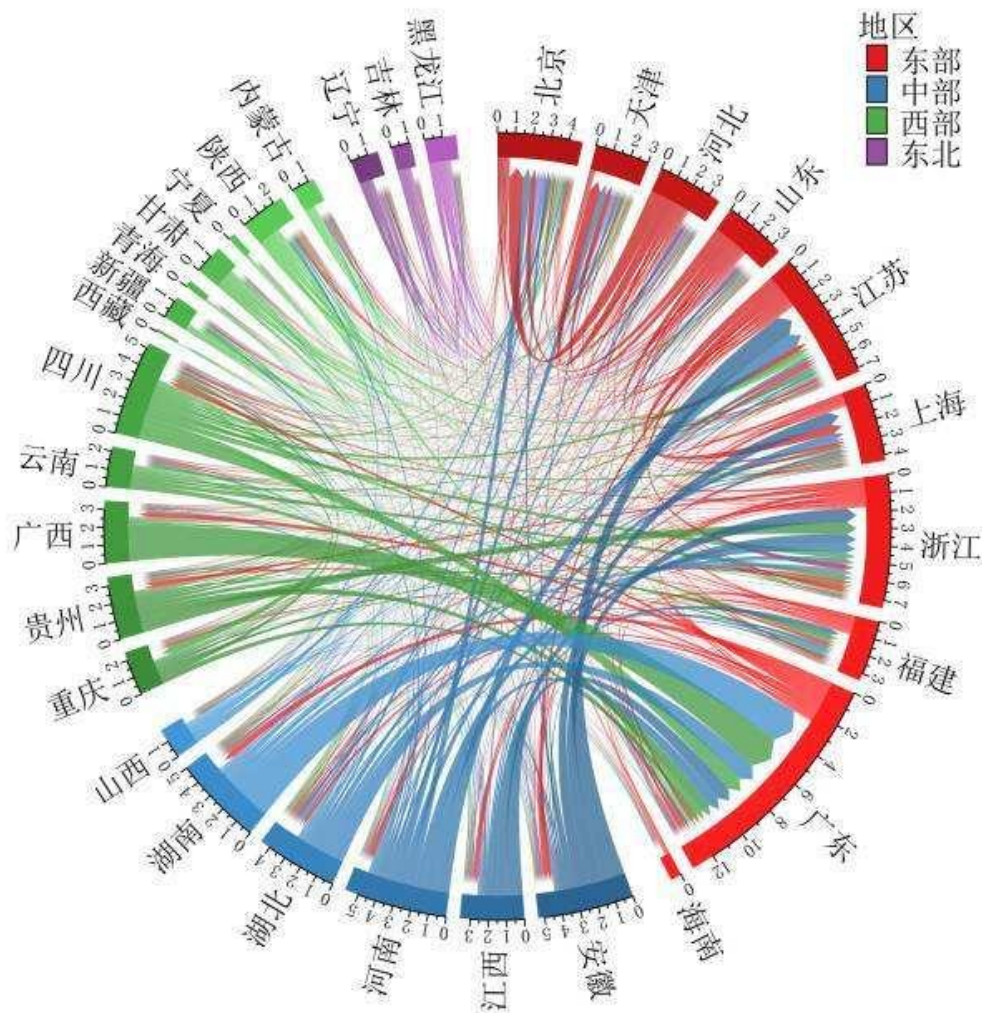
弦图

Chord Diagram



数据可视化

弦图

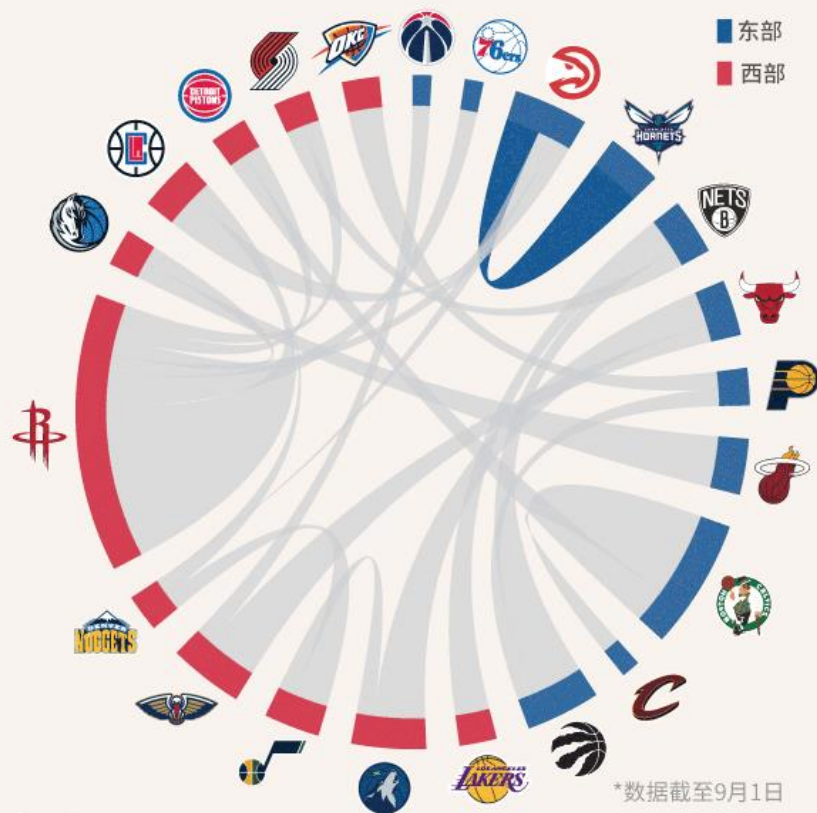


NBA休赛期球员交易

澎湃
THE PAPERS

此次交易期，保罗和欧文的交易都体现了以少换多的特点。而意在重建的东部球队则选择引进新球员，着眼未来选秀权。

6月20日	老鹰	黄蜂
交易细则	① 德怀特·霍华德	② 迈尔斯·普拉姆利
	③ 马科·贝里内利	
	选秀权	现金



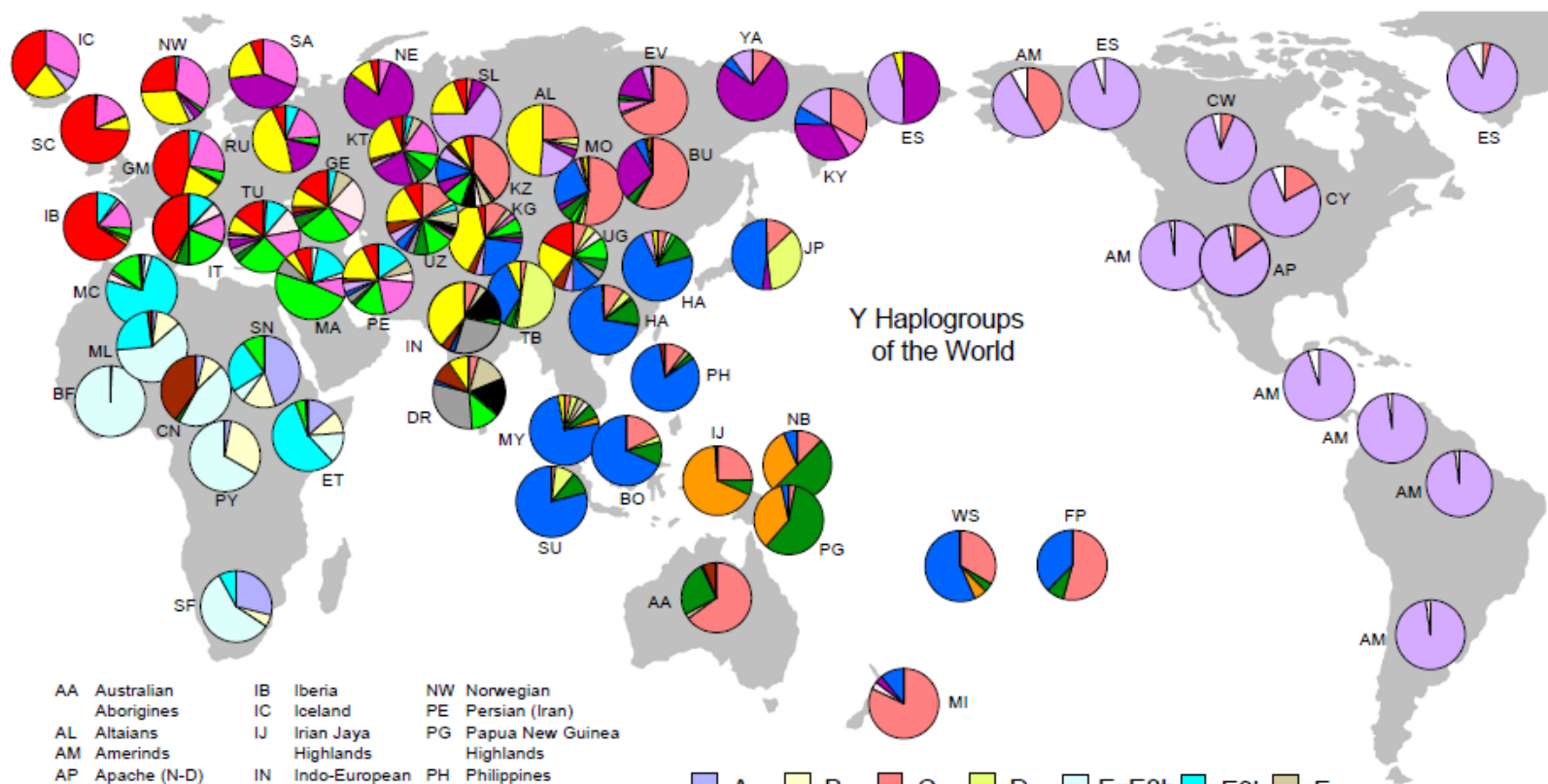
*数据截至9月1日

数据来源：NBA官网

澎湃·美数课
THE PAPERS

数据可视化

地理图



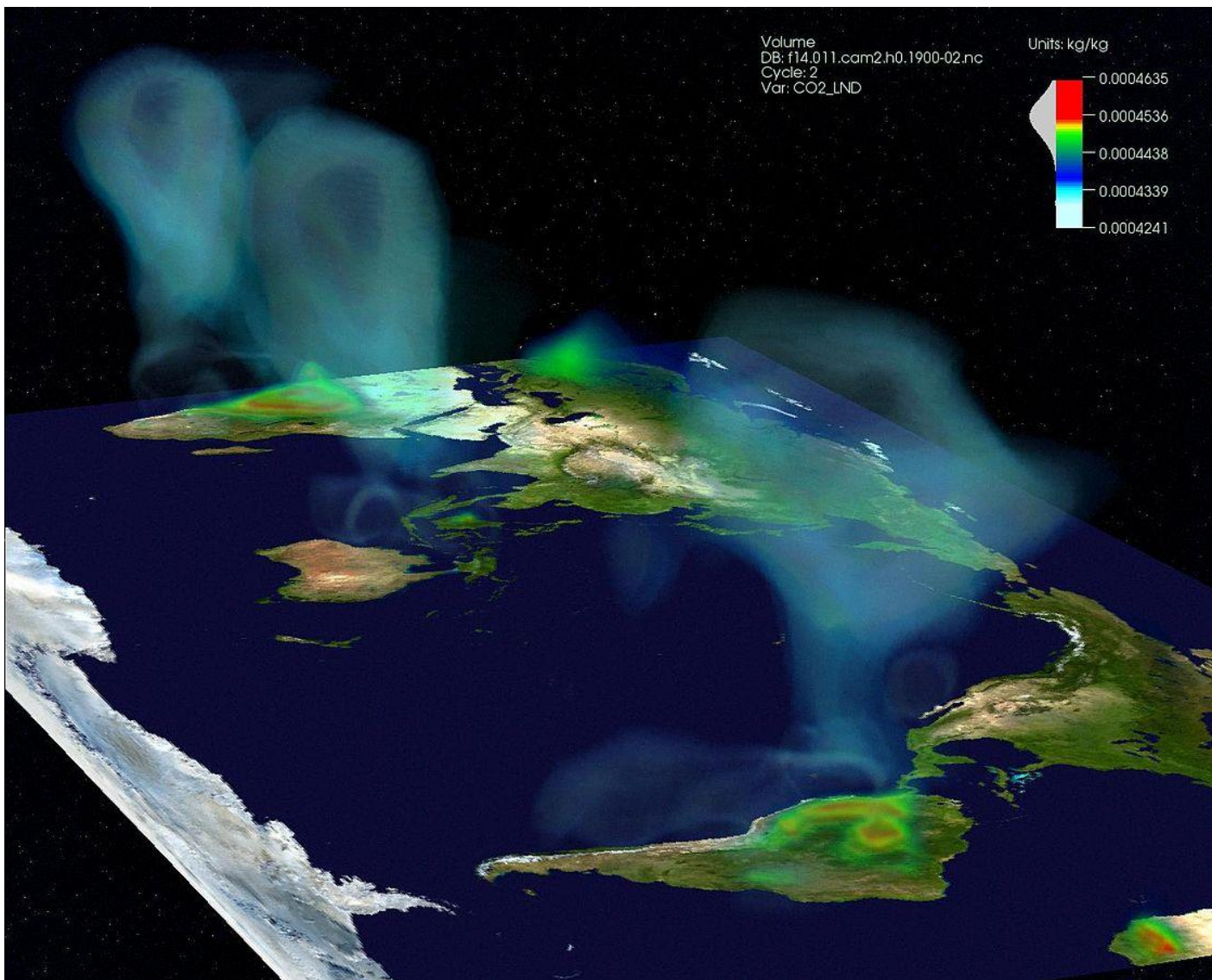
AA Australian Aborigines	IB Iberia	NW Norwegian
AL Altaians	IC Iceland	PE Persian (Iran)
AM Amerinds	IJ Irian Jaya	PG Papua New Guinea Highlands
AP Apache (N-D)	IN Indo-European	PH Philippines
BF Burkina Faso	IT Italy	PY Pygmy
BO Borneo	JP Japan	RU Russia
BU Buryats	KG Kyrgyzstan	SA Saami
CN Cameroon	KY Kazan Tatar	SC Scotland
CW Chippeway (N-D)	KT Koryaks	SL Selkups
CY Cheyenne	KZ Kazakhstan	SF South Africa
DR Dravidian	MA Mideast Arabs	SN Sudan
ES Eskimos	MC Morocco	SU Sumatra
ET Ethiopia	MI Maori	TB Tibet
EV Evenks	ML Mali	TU Turkish
FP French Polynesia	MO Mongols	UG Uygurs
GE Georgia-Armenia	MY Malaysia	UZ Uzbek
GM Germany	NB New Britain	WS Western Samoa
HA Han Chinese	NE Nenets	YA Yakuts

A	B	C	D	ExE3b	E3b	F
G	H	I	J	K	L	M
N	O	P	Q	RxR1	R1a	R1b
Other						

The data in this map is supposed to represent the situation before the recent European expansion beginning about 1500 AD. In some cases such as some Native American tribes and the Maori this can be done reliably because STR typing was done. In other cases, especially in America, it is guesswork. The "Other" sectors in America indicate this. Native American groups are labeled by language group as Amerind, Na-Dene (N-D), and Eskimo. F, K, L, and P are in some cases "catchall" groups because some researchers did not use enough markers for a full haplotype determination.

数据可视化

地理图



数据可视化

流图-streamgraph

DATAGRAPHIC

MOTORS
SPECIAL

WHO'S BEEN HOGGING THE ROAD SINCE 1973?

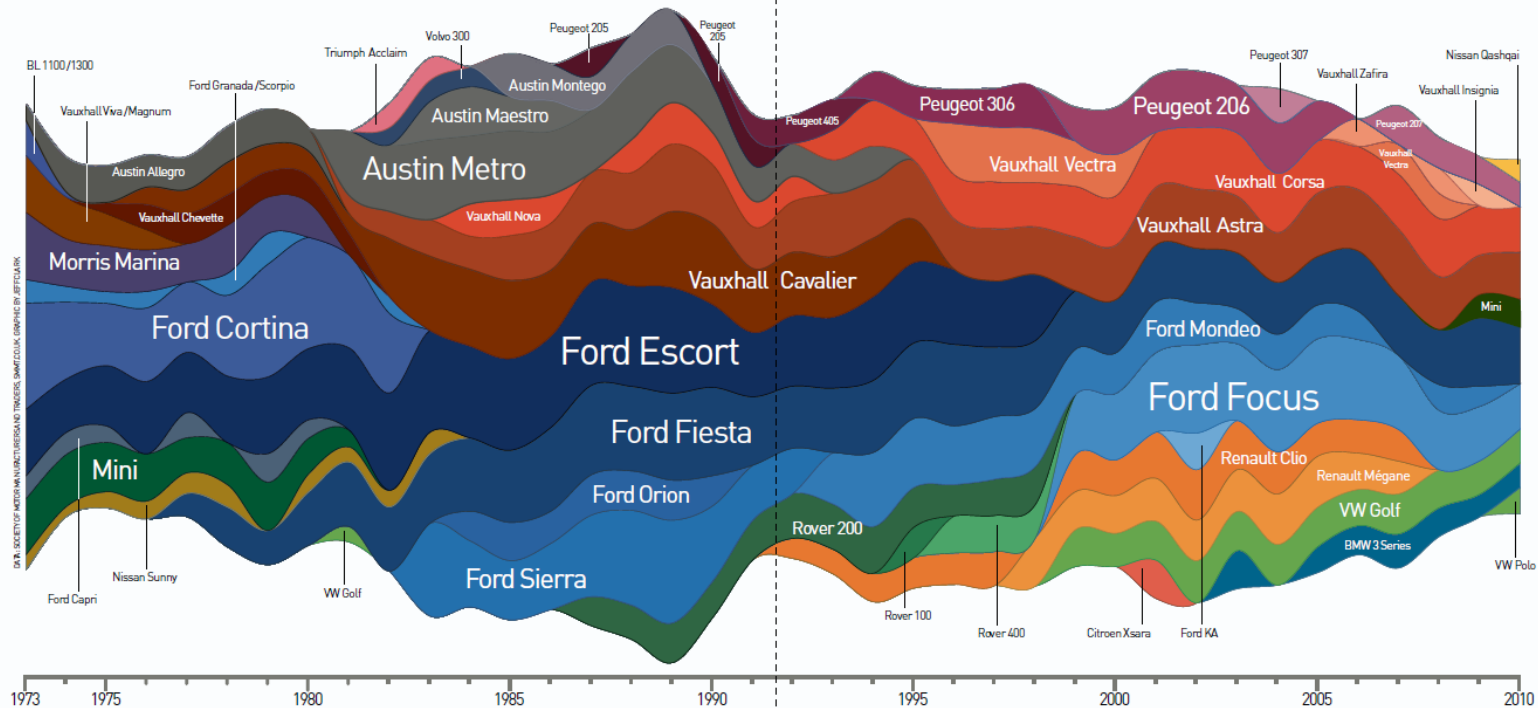
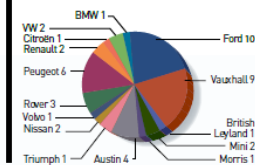
The answer is mostly Ford – as our streamgraph charting the fortunes of the ten best-selling cars in the UK for each of the past 37 years reveals

Have you driven a Ford lately? Probably. As you can see from our graphic, the iconic blue oval logo has been a constant presence in the best-selling car charts for decades. The thickness of each bar follows the annual sales for that car, combining to paint a picture of Britain's

most popular vehicles over the last 37 years. Despite all the advertising campaigns, flashy concepts and money no-object supercar dreams, we show a remarkable lack of imagination when it comes to buying a new motor. Since records began, 44 models, belonging to 15 different marques, have been represented in the top ten, but Ford and Vauxhall alone account for 19 of those. For years we've been wedded to small, reliable cars – but our tastes are diversifying: the BMW 3 Series, Renault Mégane and Nissan Qashqai have recently crept in. And there's one 'British' classic we've fallen in love with all over again: the Mini – now owned by BMW. ■

Scale:
Number of cars sold
0
50,000
100,000

Number of models by marque

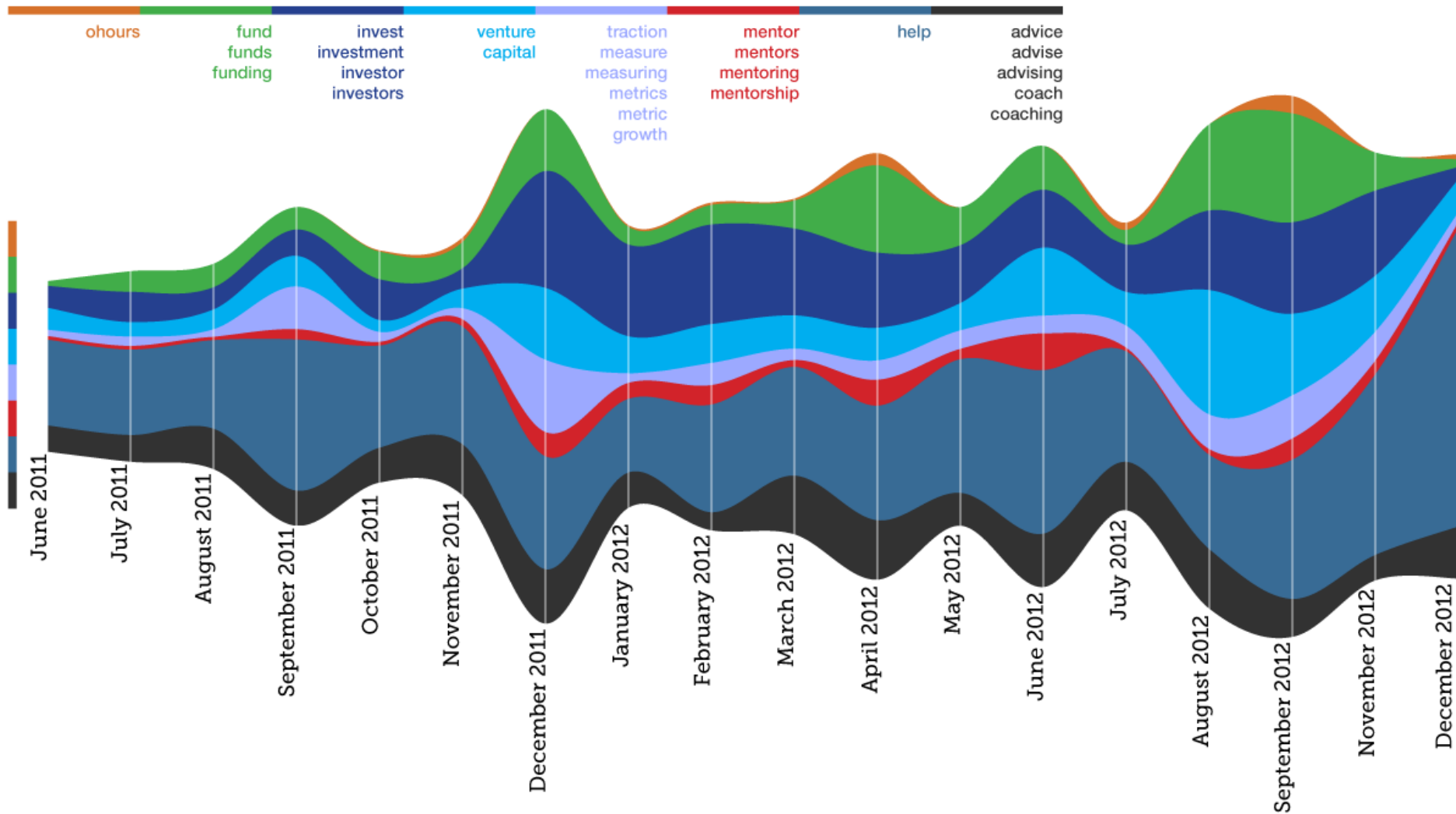


数据可视化

流图-streamgraph

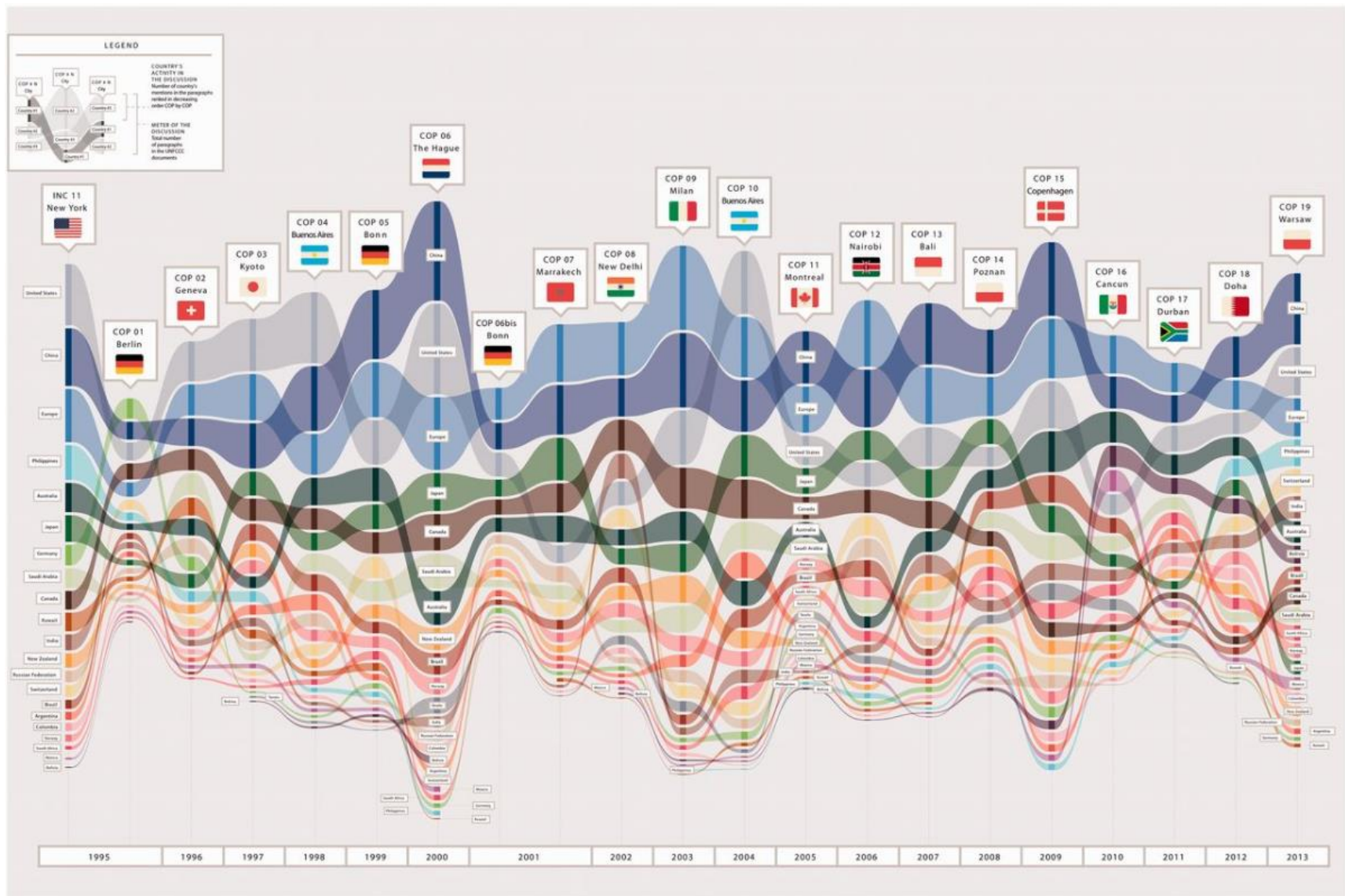
PSL ListServ Streamgraph

Visualized by Ben Farahmand || www.benfarahmand.com



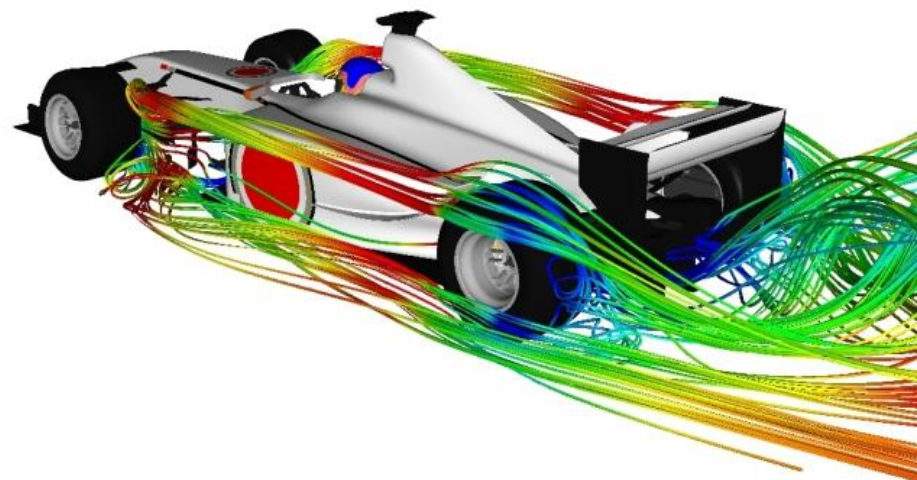
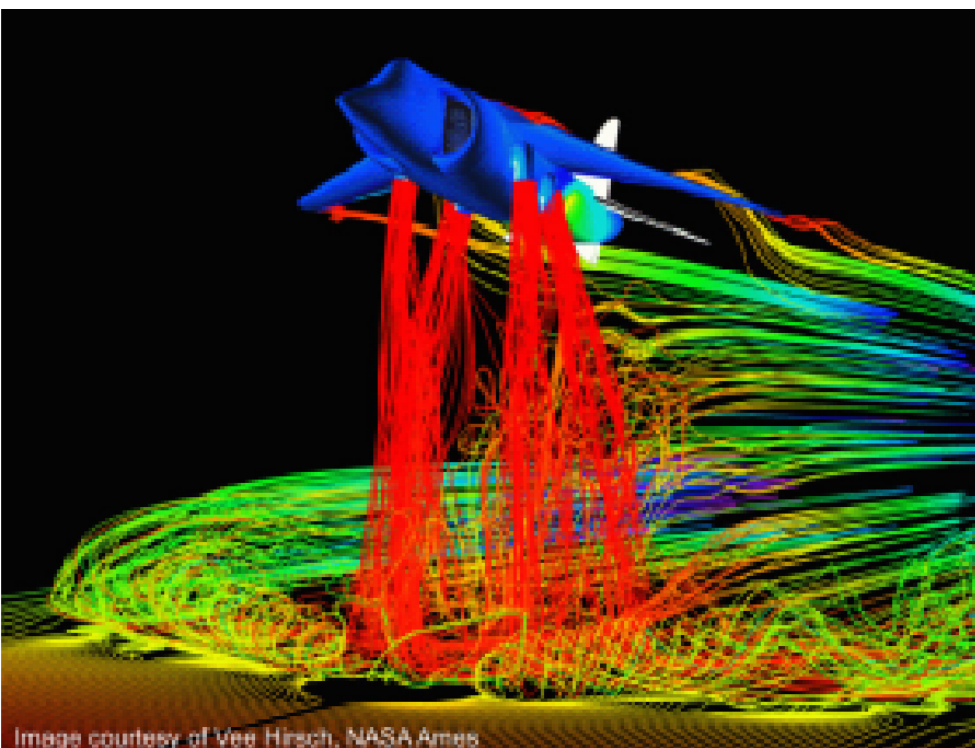
数据可视化

流图-streamgraph



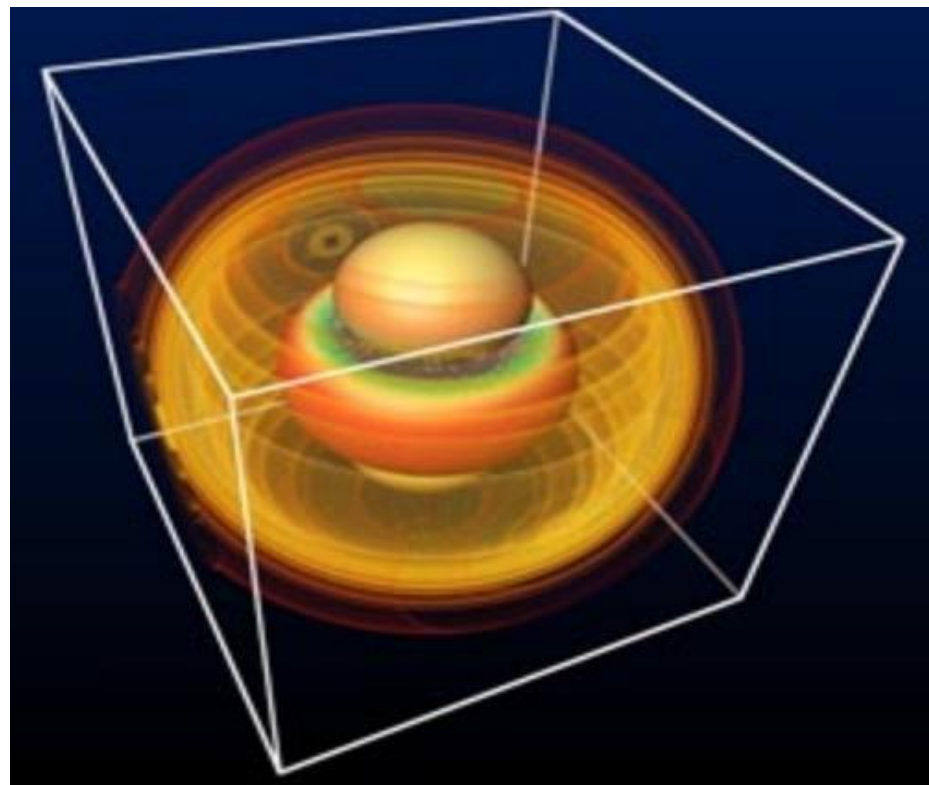
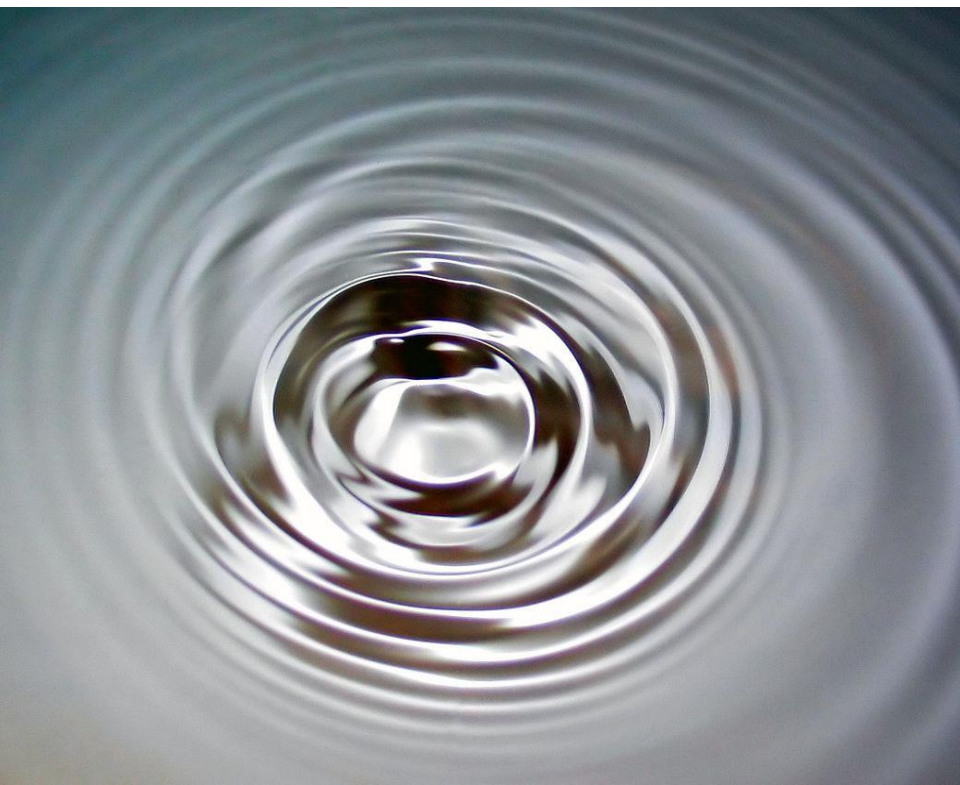
数据可视化

其他



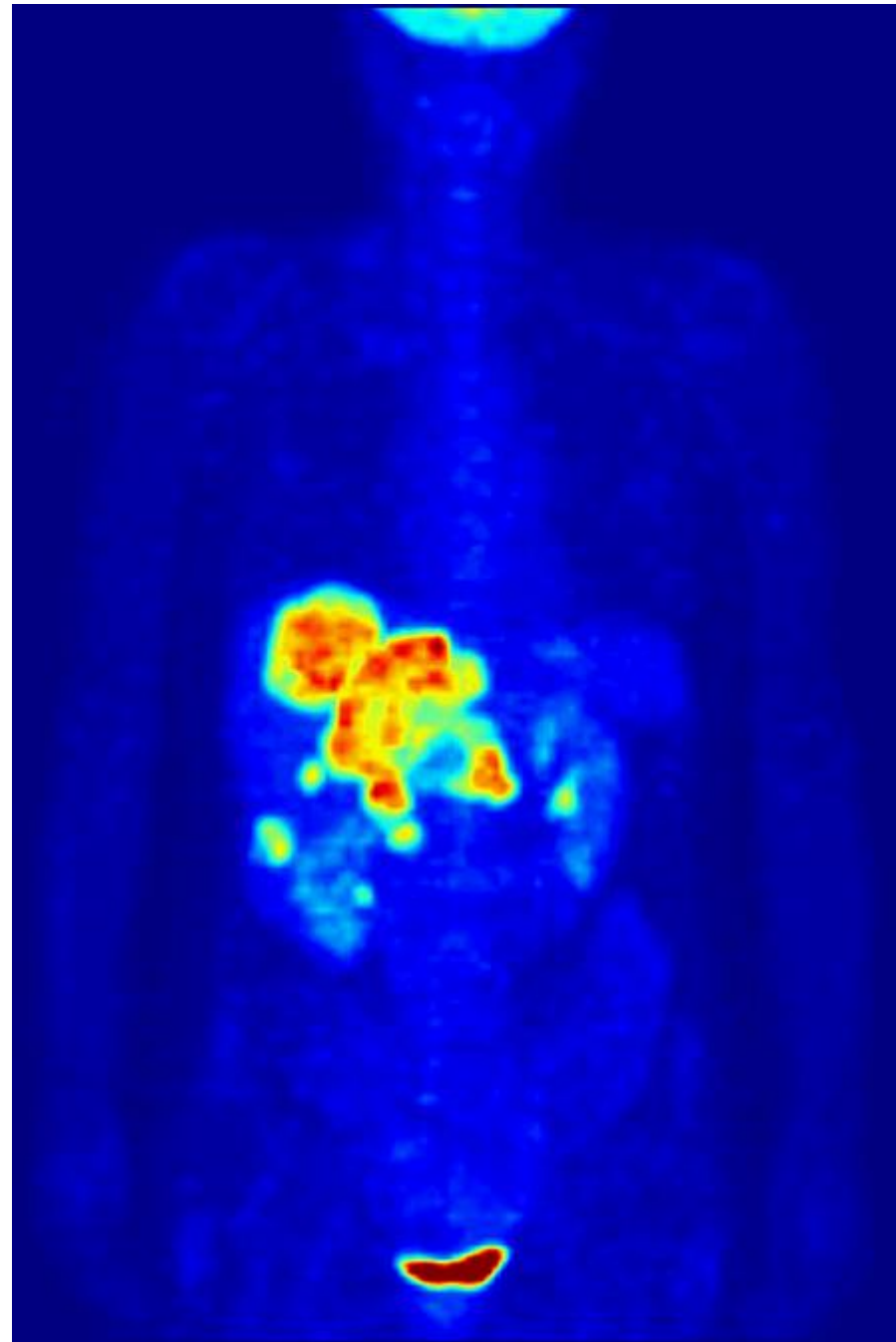
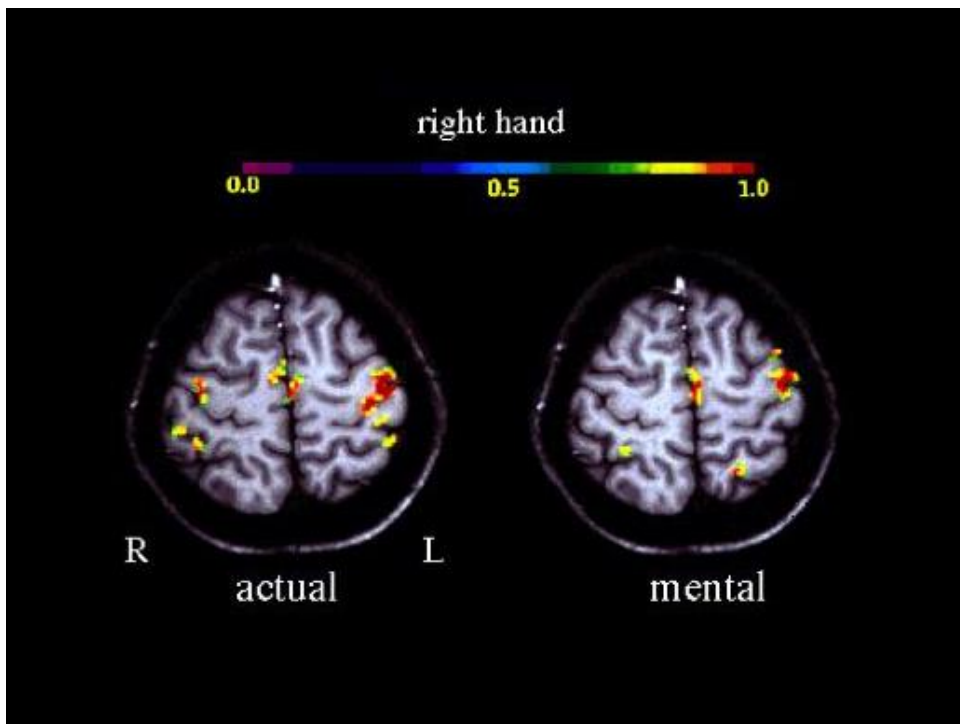
数据可视化

其他



数据可视化

其他



数据可视化

其他

