Interactive, animated web graphics using the animint package

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animint renders interactive, animated web graphics

`http://github.com/tdhock/animint`

- Motivation: high-dimensional time series (several linked plots).
- User writes only R code (a list of ggplots).
- animint exports/converts to csv/json/html/Javascript files.
- Rendered in a web browser using the D3 Javascript library. Bostock et al 2011. D3 data-driven documents. IEEE Transactions on Visualization and Computer Graphics.

animint adds clicksSelects and showSelected aesthetics to ggplot2

ggplot2 aesthetics map data variables to visual properties:

x	horizontal position.
y	vertical position.
color	of lines/points.
size	thickness/width of lines/points.
clickSelects	clicking changes the selected value.
showSelected	only show the selected data subset.
showSelected2, showSelected3	for use with several variables.

Demo code: a named list of ggplots with clickSelects and showSelected aesthetics

```
library(ggplot2)
TimeSeries <- ggplot()+
  geom_line(aes(showSelected=variable))+
  ...
Scatter <- ggplot()+
  geom_point(aes(clickSelects=variable))+
  ...
PlotList <- list(series=TimeSeries, scatter=Scatter)
library(animint)
gg2animint(PlotList)
```

make_ shortcuts for interactive geoms

`make_bar(data, "var")` Clickable bars with height=count of each value of var.

```
aes(clickSelects=var)
```

`make_tallrect(data, "var")` Clickable vertical bars for each value of var.

```
aes(clickSelects=var)
```

`make_text(data, x, y, "var", format)` Text with the selected `sprintf(format, value)`.

```
aes(showSelected=var)
```

Comparison of packages that can make a multi-plot animation of WorldBank/Gapminder data

`https://github.com/tdhock/interactive-tutorial/tree/master/animation`

Package	years	interaction vars	programming	lines of R code
tcltk	1991-	several	object	100s
animation	2007-	1 = time	imperative	40
shiny	2012-	several	reactive	60
animint	2013-	several	declarative	20

Points in common:

- Multiple linked plots.
- Multiple layers (e.g. points and lines) per plot.
- Click to show/hide subsets of data.
- Animation.
- Write only R code (not JavaScript).

Limitations, future work

- Only interactivity is
  - show/hide data subsets (showSelected), and
  - highlight the current selection (clickSelects).
- Contributions welcome: would be nice to support
  - aes(tooltip),
  - aes(hoverSelects),
  - zooming,
  - selecting multiple data points,
  - annotation.
- Large data sets are slow to
  - compile, when there are many more data subsets than you will ever look at.
  - render, when $> 10,000$ points onscreen.

Thank you!

Supplementary slides appear after this one.

Google Summer of Code

Student gets $5000 for writing open source code for 3 months.

March	Admins (such as myself) for open source organizations e.g. R, Bioconductor apply to Google.
April	Mentors suggest projects for each org.
May	Students submit project proposals to Google.
	Mentors rank student/project proposals.
	Google gives n students to an org.
June	The top n students get $500 and begin coding.
August	Midterm evaluation, pass = $2250.
September	Final evaluation, pass = $2250.
November	Orgs get $500/student mentored.

We can be **mentors** (get code written) and **students** (get paid).