An introduction to the ggplot2 extension ecosystem

ggplot2 extension packages

Package extension stats: 309 packages

Source	Number of Packages
CRAN and Gallery	127
CRAN not in Gallery	128
Gallery never CRAN	17
Gallery and archive	7
CRAN archive only	30

Inclusion criteria:

- In ggplot2 extension gallery https://exts.ggplot2.tidyverse.org/; or
- On CRAN, starts with “gg” or “GG” AND mentions ggplot2 in title, description, depends, imports, or suggests; or
- In CRAN archive, starts with “gg” or “GG”

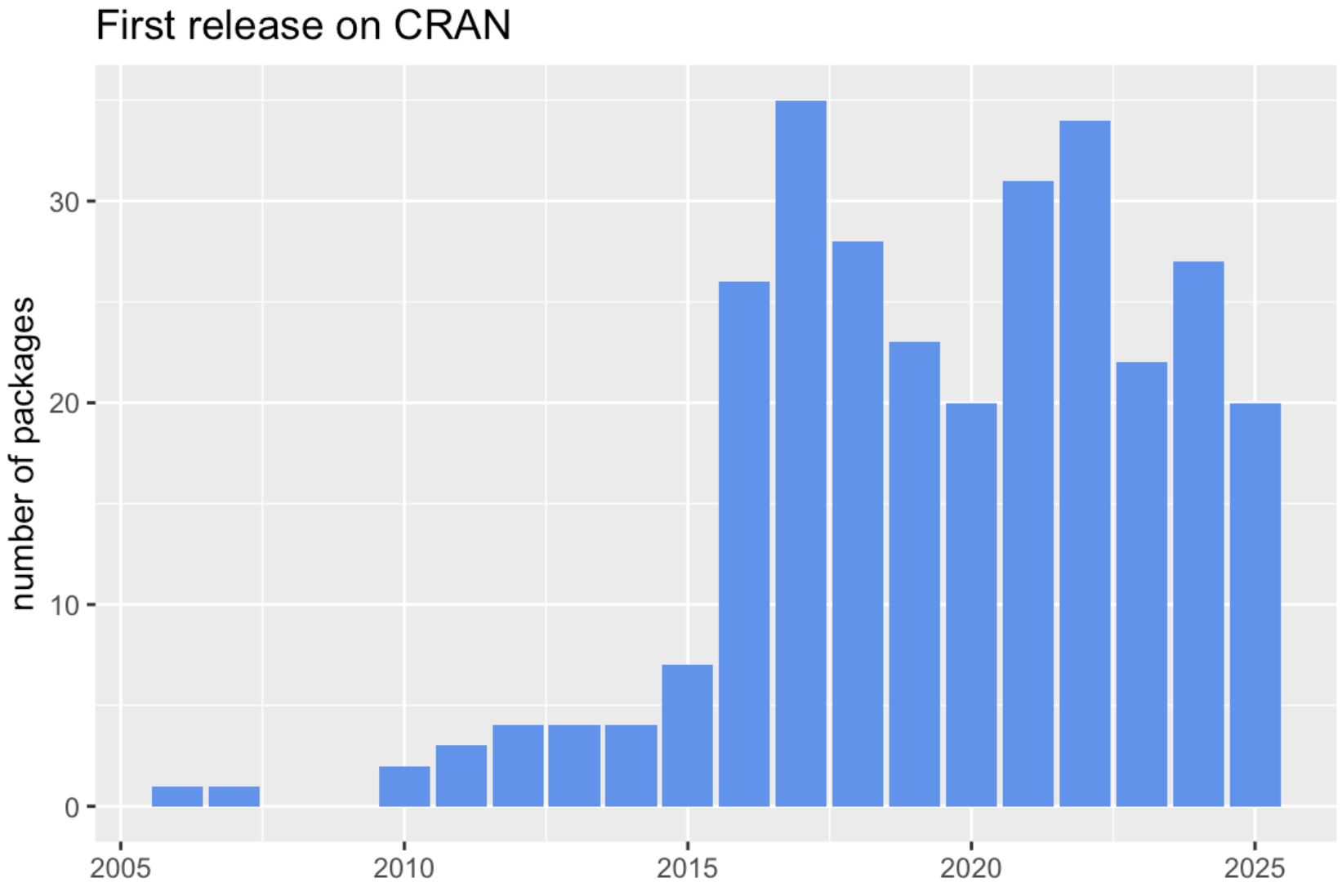
First 10 packages

package	first_release	on_cran
ggplot	2006-04-06	FALSE
ggplot2	2007-06-01	TRUE
GGally	2010-02-01	TRUE
directlabels	2010-11-26	TRUE
ggcolpairs	2011-02-16	FALSE
GGEBiplotGUI	2011-08-29	FALSE
ggmap	2011-11-30	TRUE
ggparallel	2012-08-18	TRUE
ggsubplot	2012-09-04	FALSE
ggmcmc	2012-09-05	TRUE

Latest 10 packages

package	first_release	on_cran
ggtreebar	2025-05-16	TRUE
ggpedigree	2025-05-23	TRUE
ggtime	2025-06-10	TRUE
ggmRSCU	2025-06-24	TRUE
gggda	2025-07-09	TRUE
ggtranslate	2025-07-10	TRUE
ggchord	2025-07-16	TRUE
ggcorrheatmap	2025-07-28	TRUE
ggplayfair	2025-07-28	TRUE
ggdibbler	2025-07-31	TRUE

ggplot2 ecosystem



The new era of ggplot2 extensions

Early extensions

From the ggplot2 book 2nd edition (2016):

3.14 Add-on Packages

If the built-in tools in ggplot2 don't do what you need, you might want to use a special purpose tool built into one of the packages built on top of ggplot2. Some of the packages that I was familiar with when the book was published include:

- animInt, https://github.com/tdhock/animint, lets you make you ggplot2 graphics interactive, adding querying, filtering and linking.
- GGally, https://github.com/ggobi/ggally, provides a very flexible scatterplot matrix, amongst other tools.
- ggbio, http://www.tengfei.name/ggbio/, provides a number of specialised geoms for genomic data.
- ggdendro, https://github.com/andrie/ggdendro, turns data from tree methods in to data frames that can easily be displayed with ggplot2.
- ggfortify, https://github.com/sinhrks/ggfortify, provides fortify and autoplot methods to handle objects from some popular R packages.
- ggenealogy, https://cran.r-project.org/package=ggenealogy, helps explore and visualise genealogy data.
- ggmcmc, http://xavier-fim.net/packages/ggmcmc/, provides a set of flexible tools for visualising the samples generated by MCMC methods.
- ggparallel, https://cran.r-project.org/package=ggparallel: easily draw parallel coordinates plots, and the closely related hammock and common angle plots.
- ggtern, http://www.ggtern.com, lets you use ggplot2 to draw ternary diagrams, used when you have three variables that always sum to one.
- ggtree, https://github.com/GuangchuangYu/ggtree, provides tools to view and annotate phylogenetic tree with different types of meta-data.
- granovaGG, https://github.com/briandk/granovaGG, provides tools to visualise ANOVA results.
- plotluck, https://github.com/stefan-schroedl/plotluck: the ggplot2 version of Google's "I'm feeling lucky". It automatically creates plots for one, two or three variables.

Beginnings of a typology

1. “By the book” extensions: plots are initialized with `ggplot()`; new elements are added beginning with `geom_`, `stat_`, `coord_`, `facet_`, etc.
2. “Complete plots”, “autoplots”, “out of grammar”, many not counted in our list of extensions (On CRAN alone, there are 411 packages that depend on ggplot2 and 3773 that import it.)
3. Many packages that are neither, with great diversity. Could be called “variations in dialect tailored to domain-specific needs.”

“By the book” packages

ggplot2 book, 3rd edition (online), extensions chapter:

20.1 New themes

20.2 New stats

20.3 New geoms

20.4 New coords

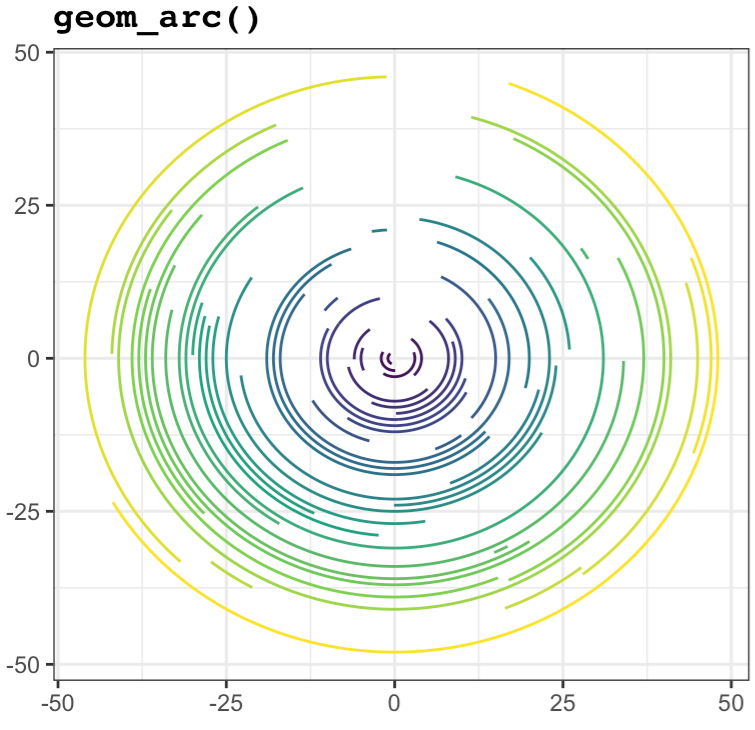
20.5 New scales

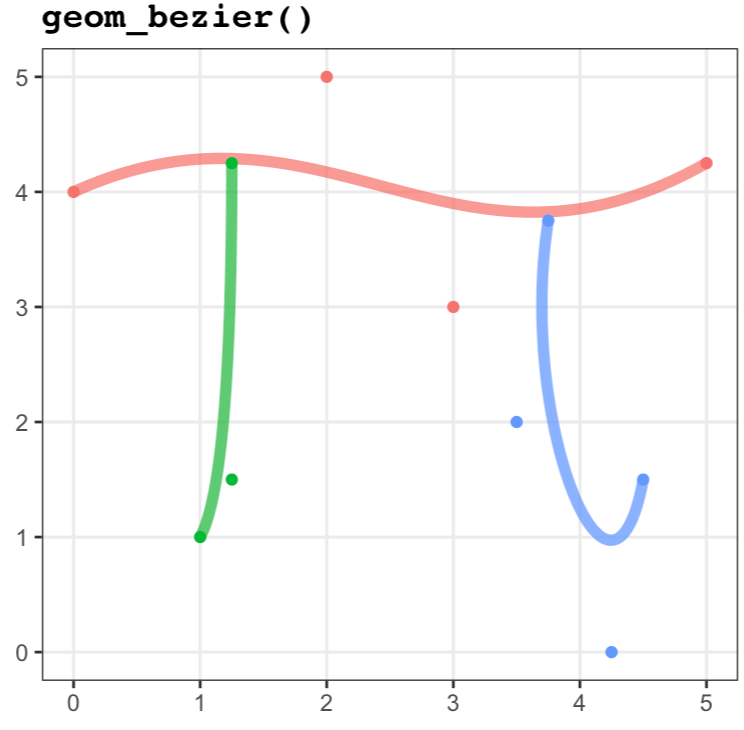
20.6 New positions

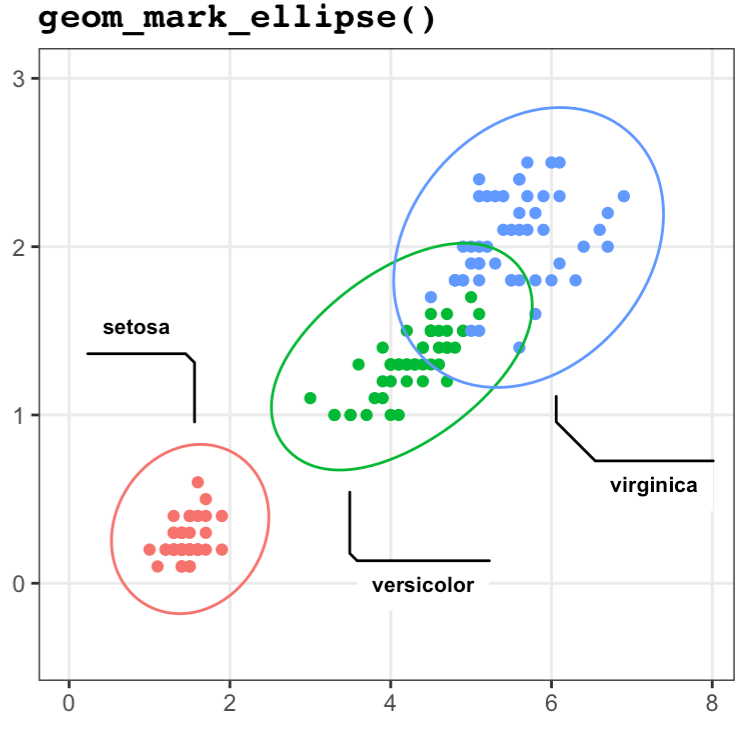
20.7 New facets

New geoms

ggforce



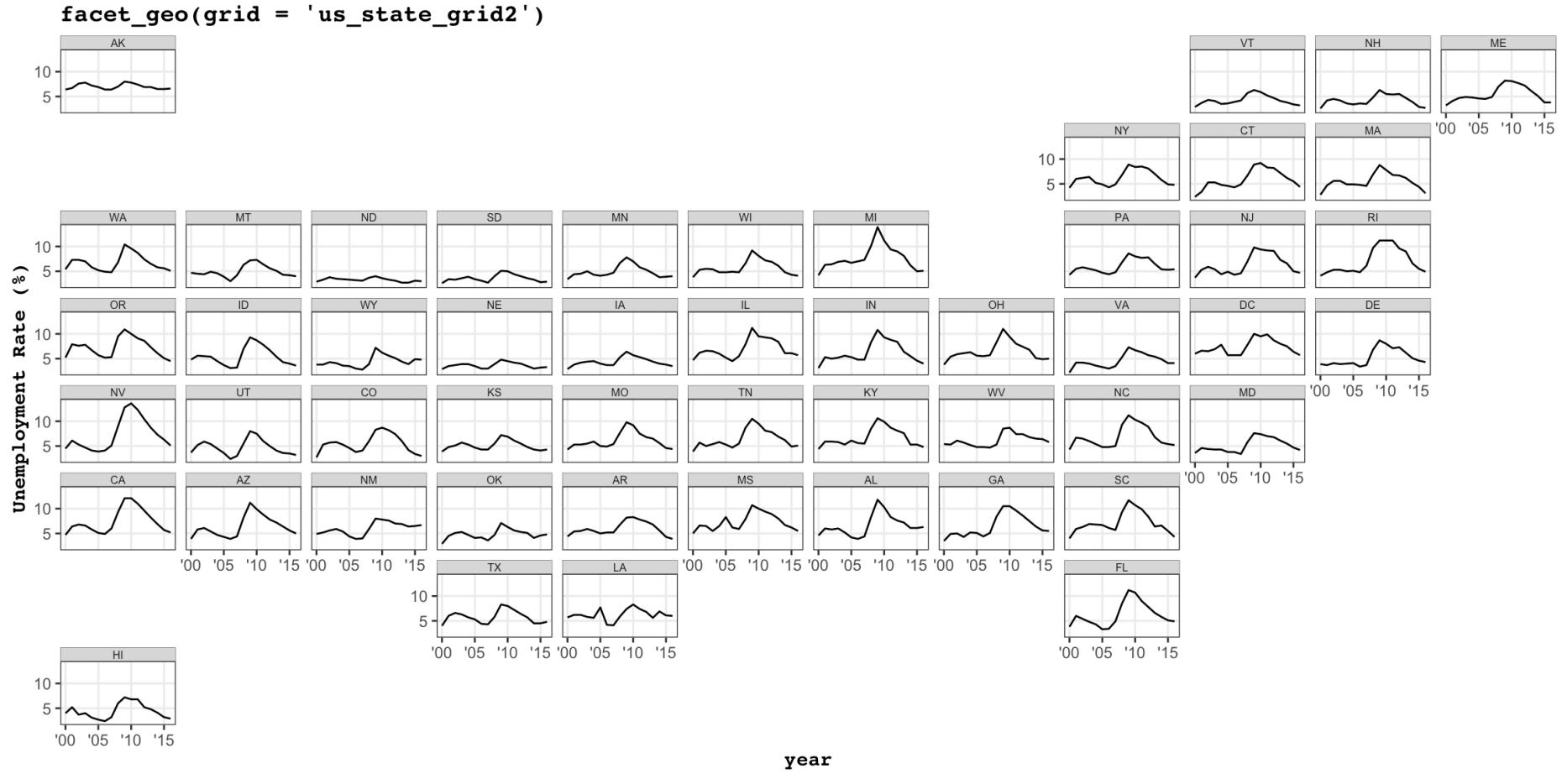




https://ggforce.data-imaginist.com/

New facets

geofacet

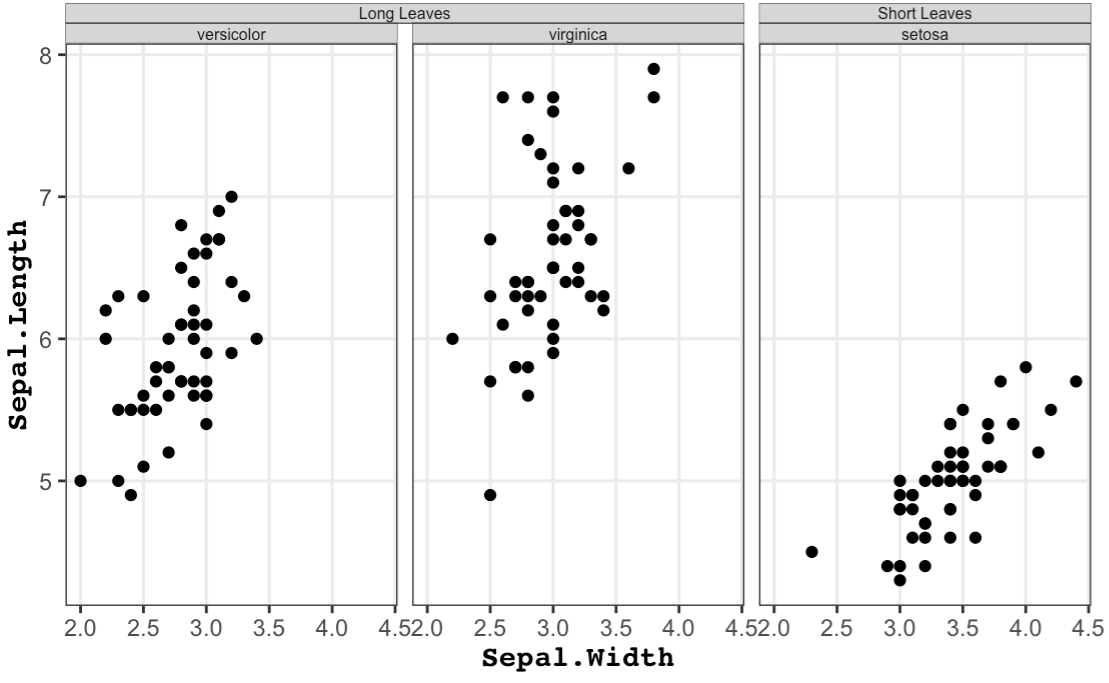


Code source: https://github.com/hafen/geofacet/

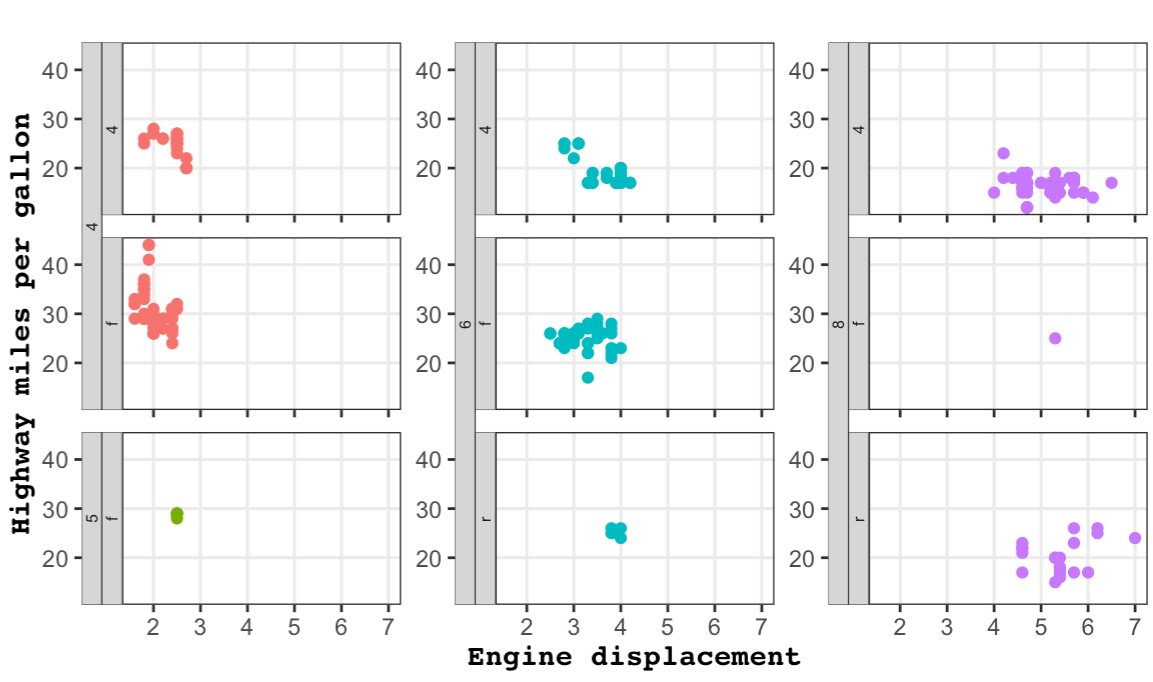
New facets

ggh4x

facet_nested()



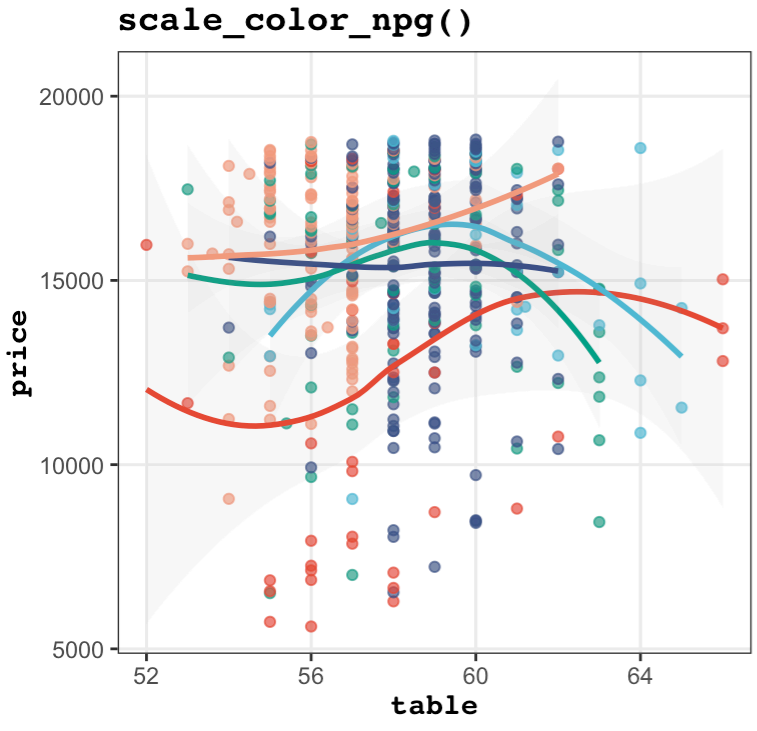
facet_nested_wrap()

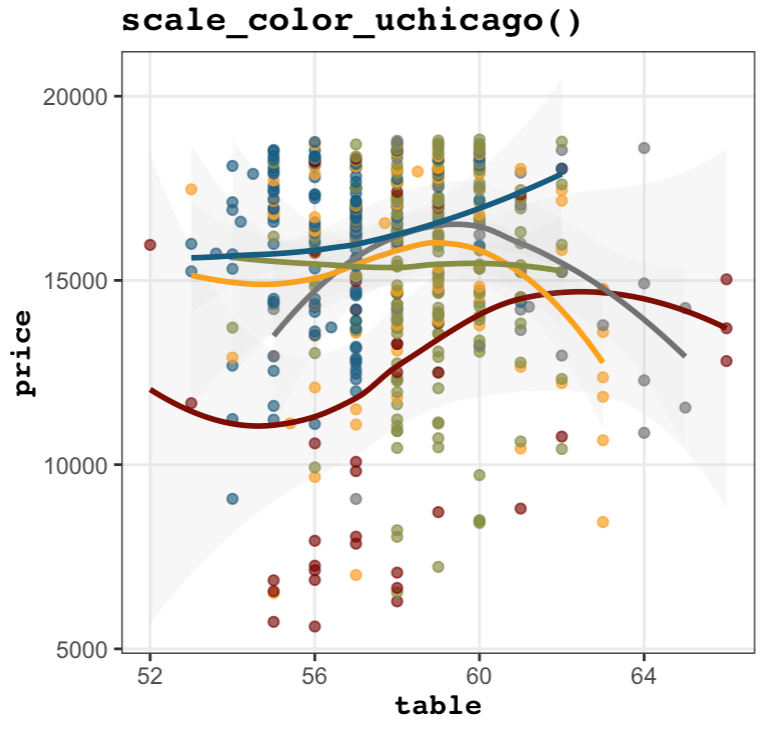


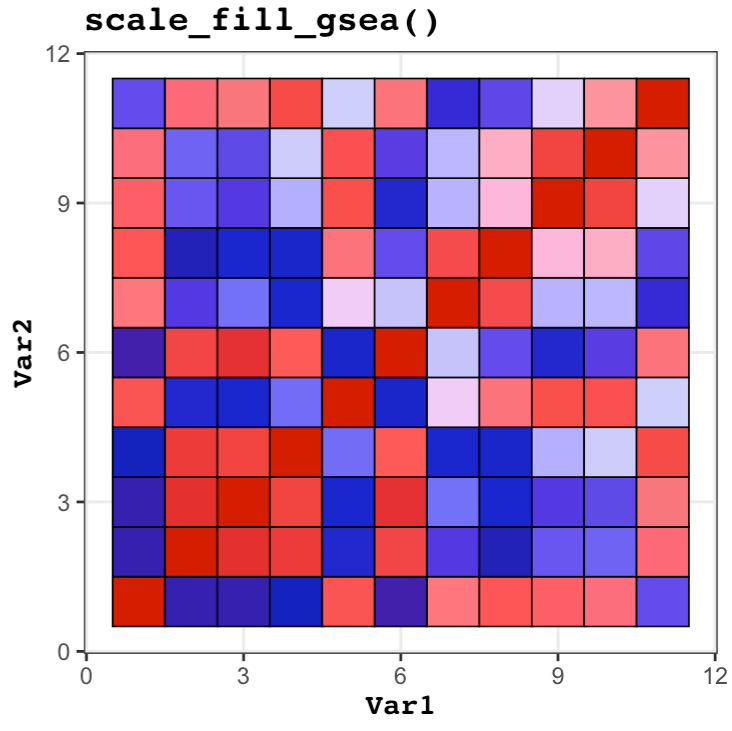
Code source: https://teunbrand.github.io/ggh4x/articles/Facets.html

New Scales

ggsci



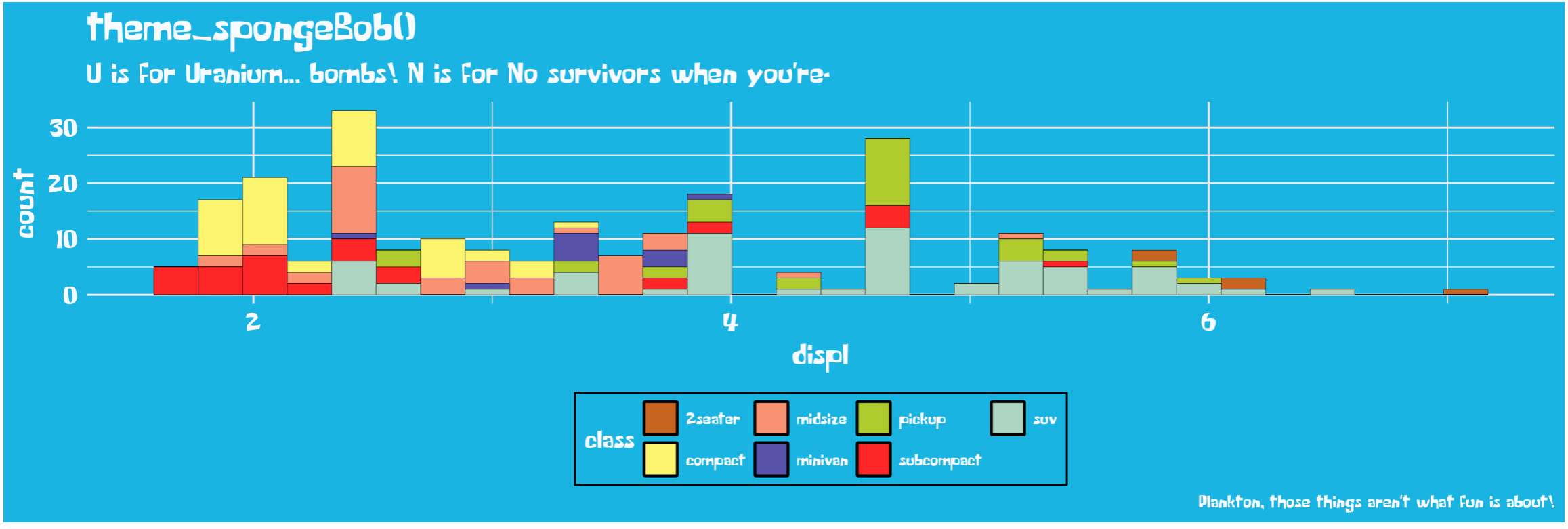




Code source: https://nanx.me/ggsci/articles/ggsci.html

New themes

tvthemes



Code source: https://ryo-n7.github.io/tvthemes/articles/examples.html

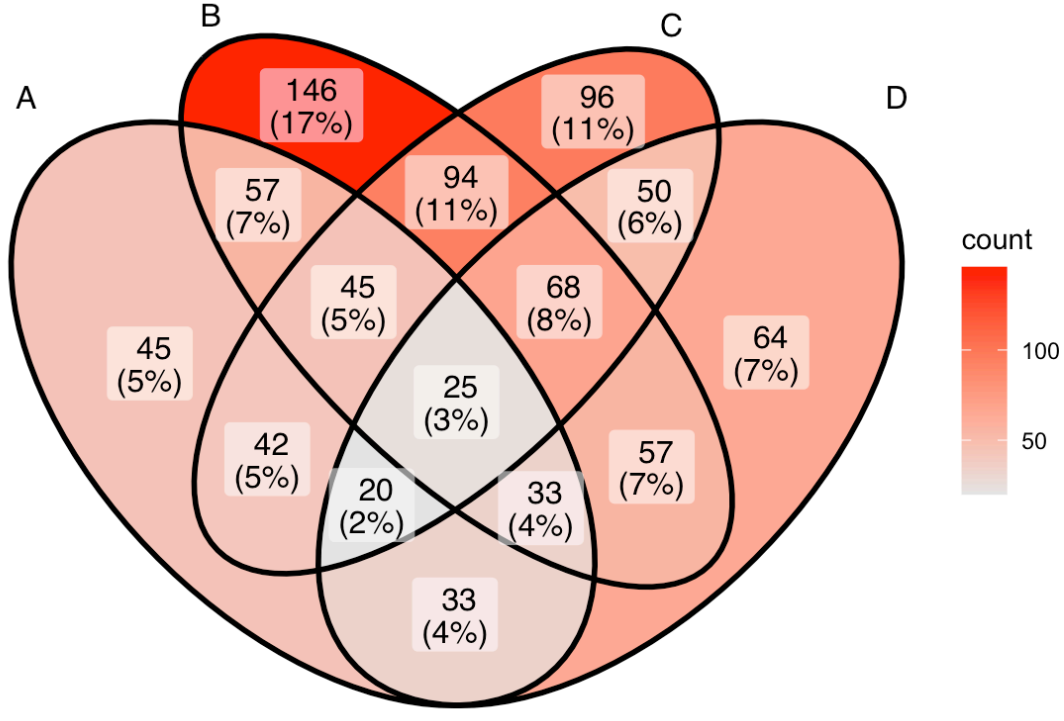
Complete plots

- Serve many different purposes, from wrapping basic ggplot2 plots to simplifying the grammar to creating complex plots without introducing new components
- Vary in degree of compatibility with ggplot2, due to degree of data transformation, and type of object returned. In general at a minimum you can add labels with ggplot2 functions though not always if a ggplot2 object is not returned.

Complete plot

ggVennDiagram

```
1  ggVennDiagram(x) +
2    scale_fill_gradient(low="grey90",high = "red")
```

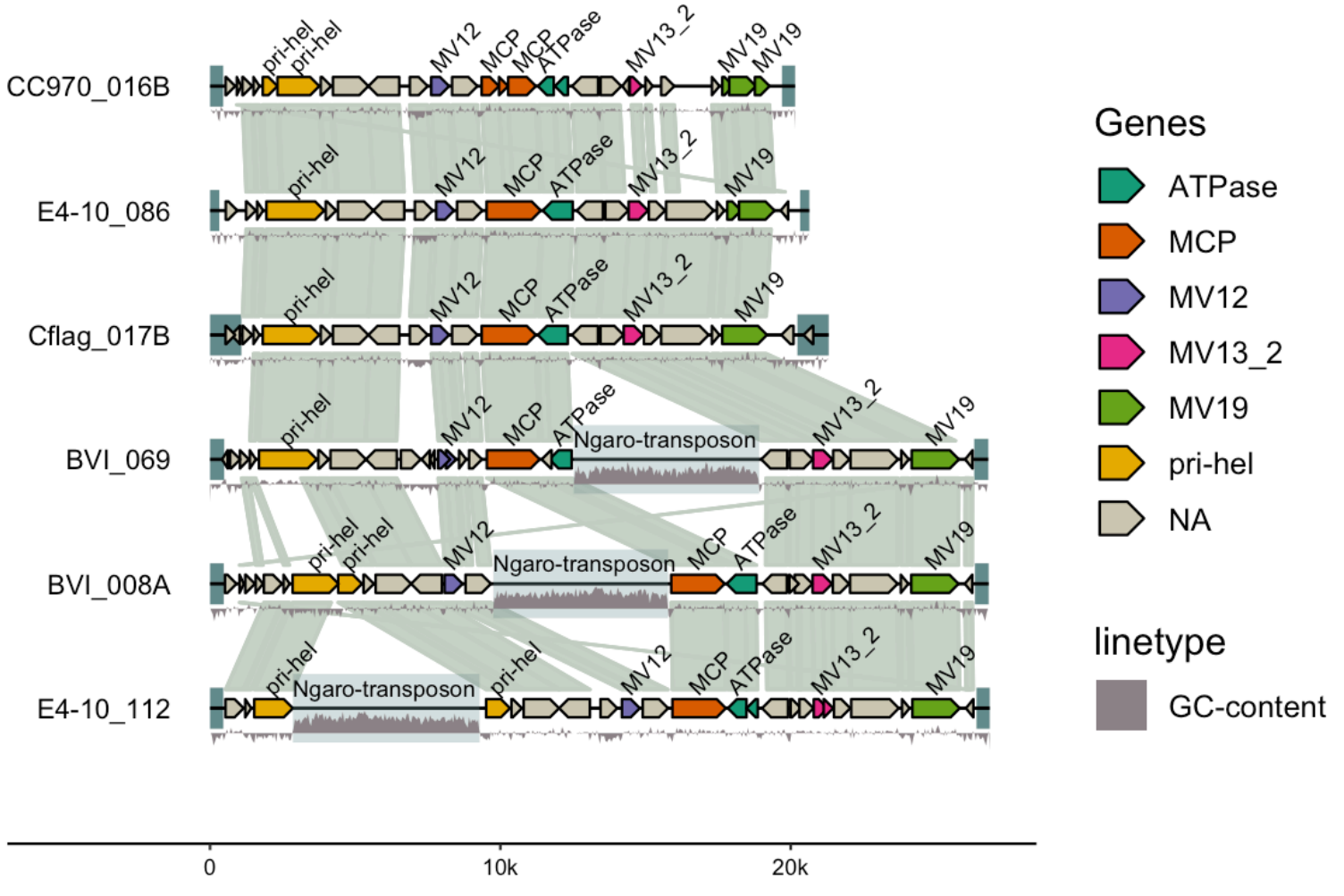


Code source: https://github.com/gaospecial/ggVennDiagram

Dialect variations

- new plotting initialization functions *and* components, new grammars?
- combine multiple plots (different from faceting)
- add animation / interactivity
- add RStudio addin

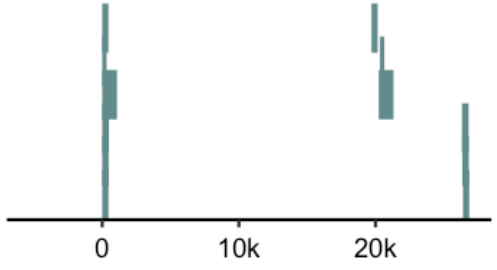
gggenomes



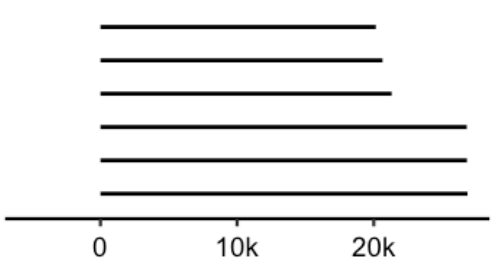
Code source: https://thackl.github.io/gggenomes/

gggenomes individual geoms

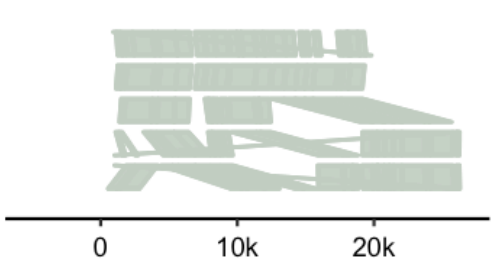
geom_feat()



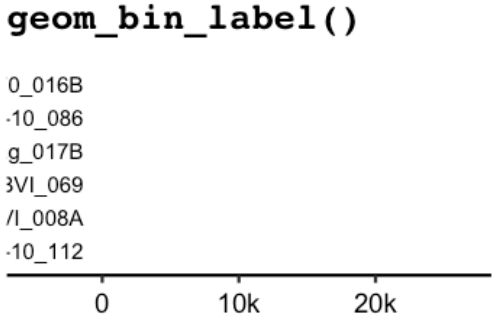
geom_seq()



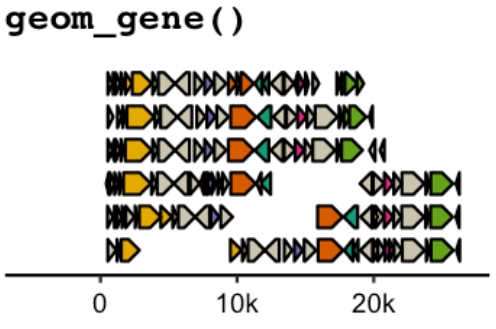
geom_link()



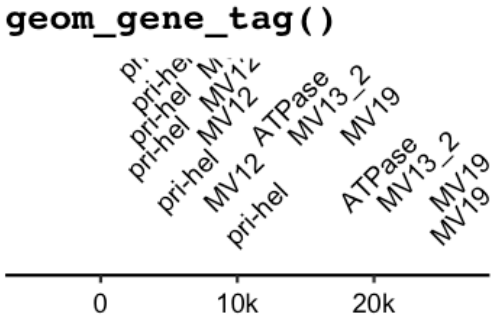
geom_bin_label()



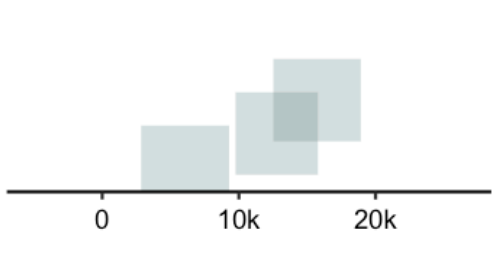
geom_gene()



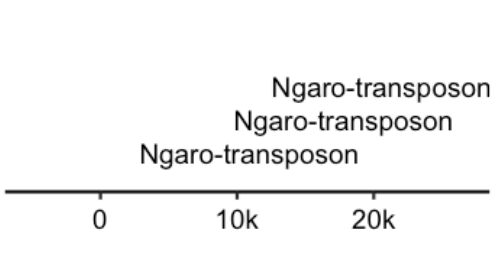
geom_gene_tag()



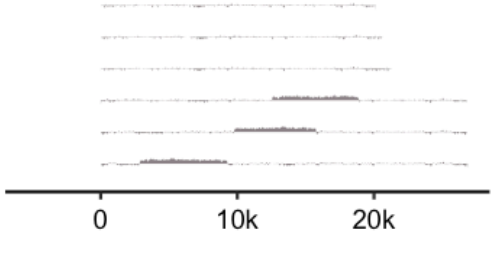
geom_feat()



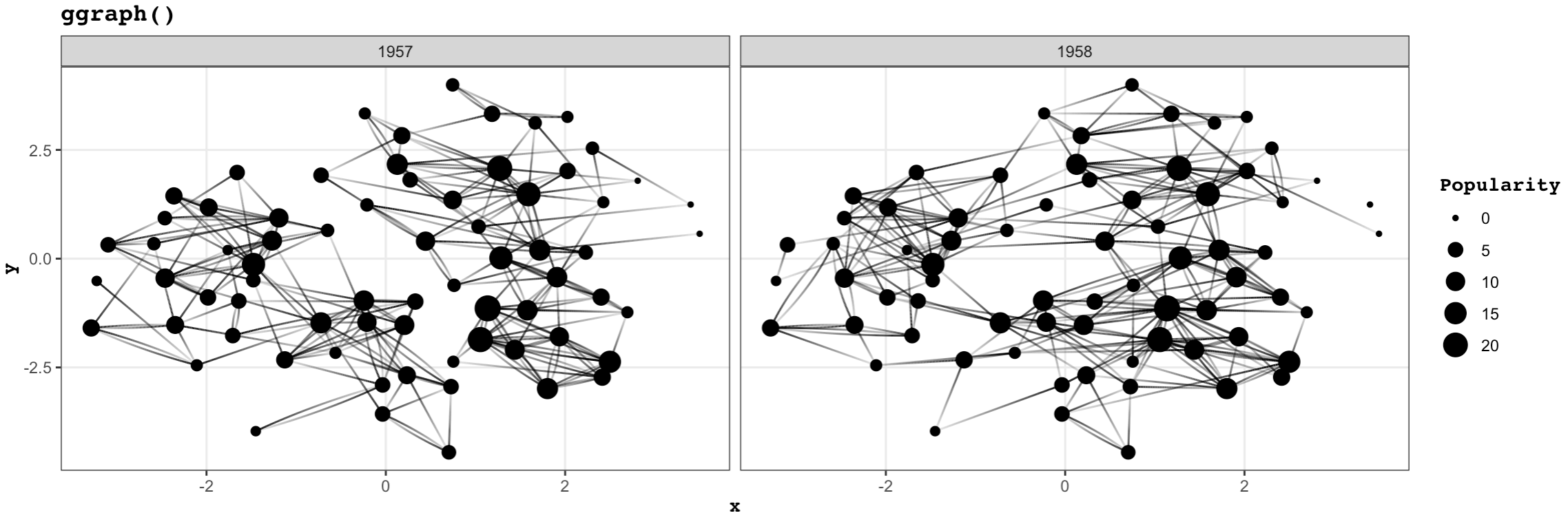
geom_feat_note()



geom_wiggle()

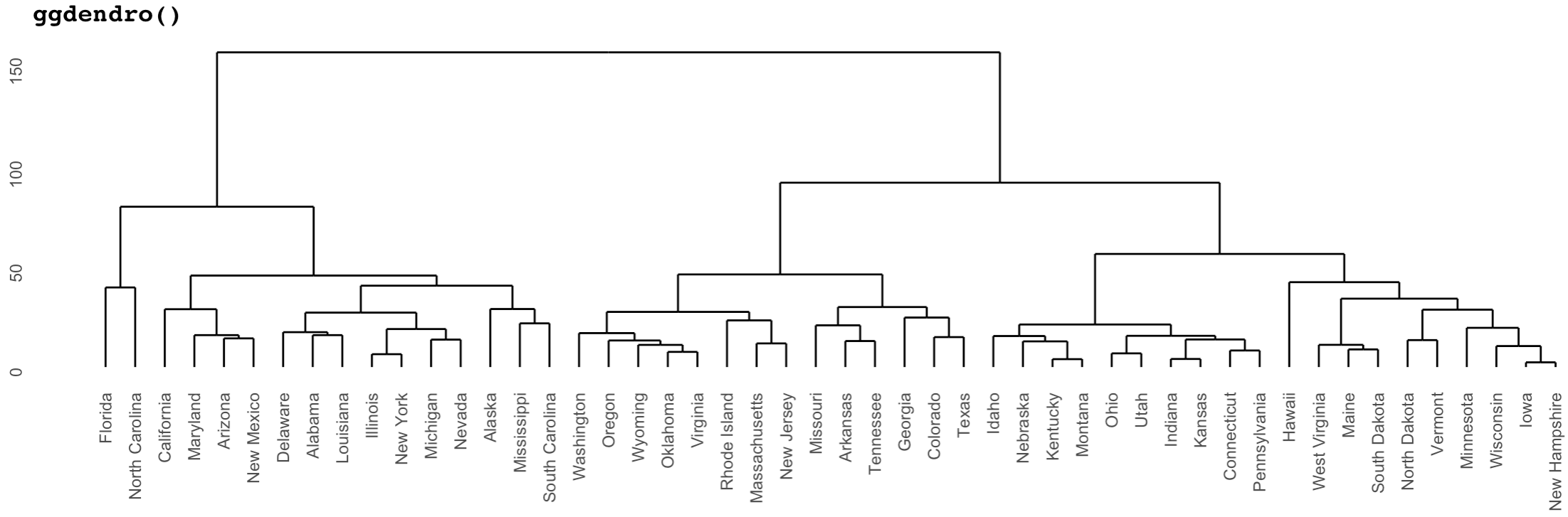


ggraph



Code source: https://ggraph.data-imaginist.com/

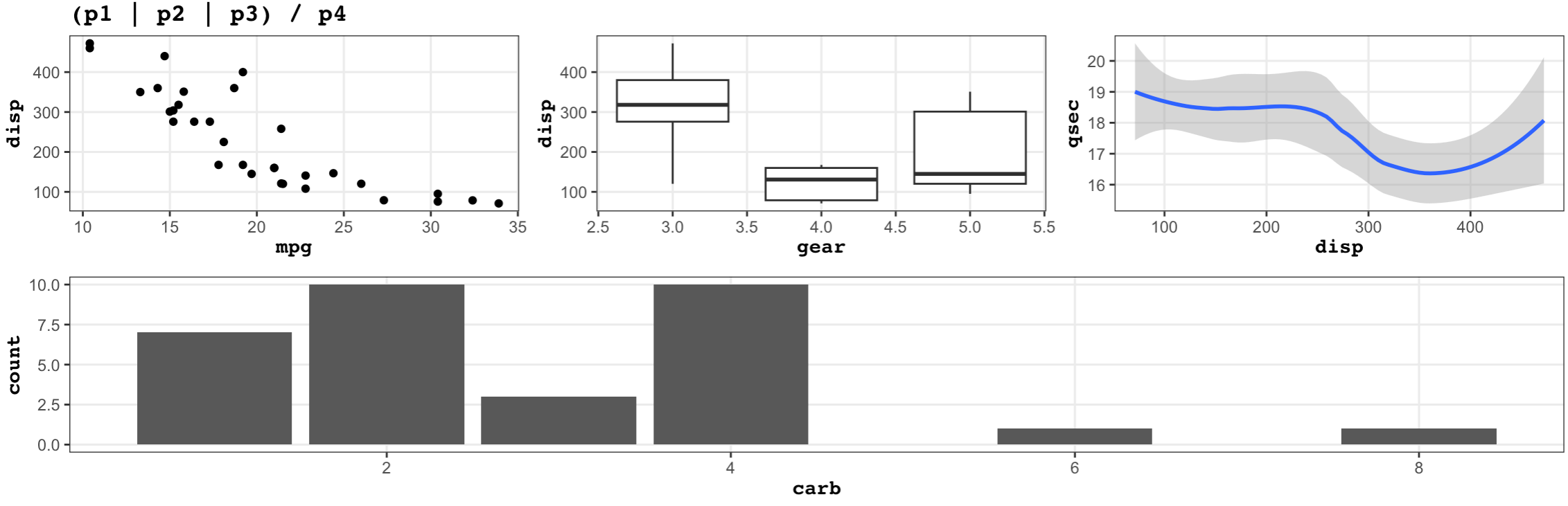
ggdendro



Code source: https://cran.r-project.org/web/packages/ggdendro/vignettes/ggdendro.html

Combining plots

patchwork



Code source: https://patchwork.data-imaginist.com/

Takeaways

- Easy geom recipes
- Extension group
- Extension gallery: https://exts.ggplot2.tidyverse.org/gallery/