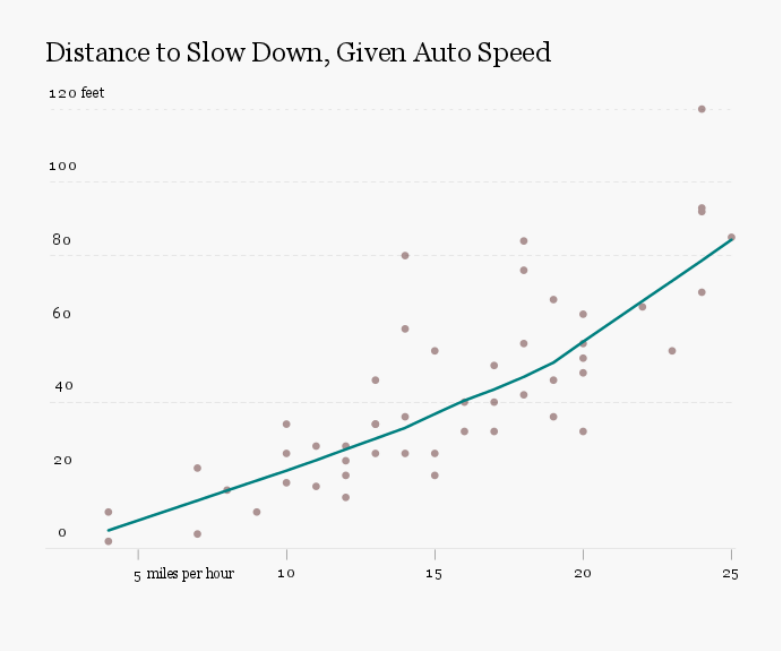
How to Hand Edit R Plots in Inkscape

By **Nathan Yau**

You can control graph elements with code as you output things from R, but sometimes it is easier to do it manually. Inkscape, an Open Source alternative to Adobe Illustrator, might be what you are looking for.

Download Source



I do most of my graph work in R since it's good at handling and manipulating data. It lets me look at data from different angles. However, when I have a chart that I want to publish, I find it's easier to make the small edits, such as changing fonts and moving labels, in Adobe Illustrator. You can save R output as a PDF file, open the file in the vector-editing software, and you can click, edit, and drag everything.

The problem: Adobe's software is expensive. For me, it was worth it since I use it all the time, and if I work with a graphic designer, it's easier to exchange notes when we're using the same program. For those who just want to polish their graphs occasionally though, it's hard to justify the price. Inkscape is an Open Source alternative (read that as free) with similar capabilities.

Coming from Illustrator, there were some things about Inkscape that didn't work how I expected them to. It might just be me though. After all, I was plenty confused when getting started with Illustrator.This tutorial is a getting-started guide on how a graph goes from R to Inkscape. To be honest, this was my first non-superficial use of the program, so if anyone who has used it longer and sees a better way to get the same results.

Setup

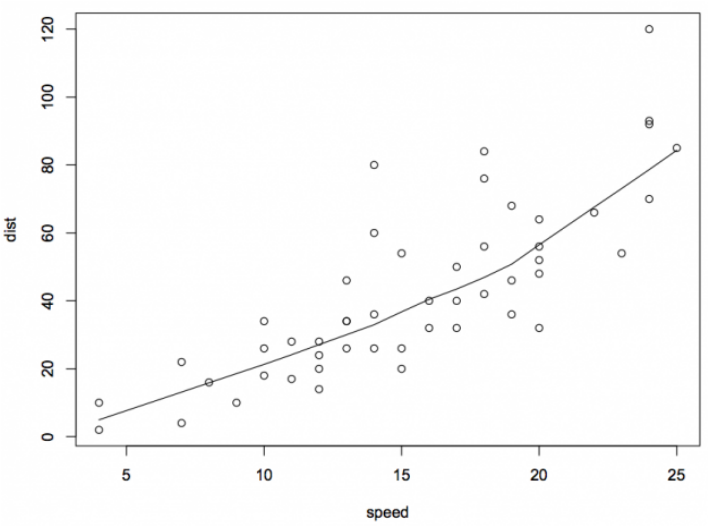
Download and install R and Inkscape, if you haven't already. Setup for both is fairly straightforward.

You can use any R plot that you want, but in this tutorial you'll focus on the default plot in the help document for R's `plot()` function.

```
require(stats)
plot(cars)
lines(lowess(cars))
```

It's simply a plot that shows data from a 50-observation experiment (from the 1920s) for the distance it takes for a car to stop at different speeds.

Default plot in R

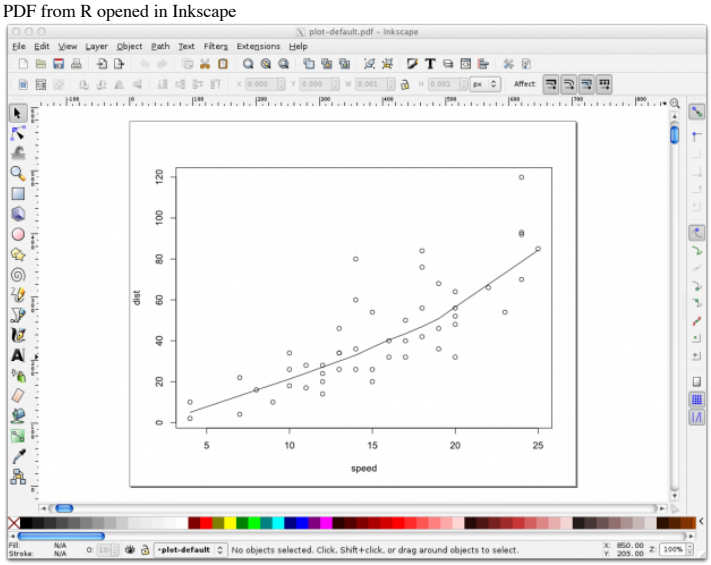


This particular plot isn't all that bad. It's pretty easy to read, but you can use Inkscape to refine it. Think of the R output as a framework.

Working in Inkscape

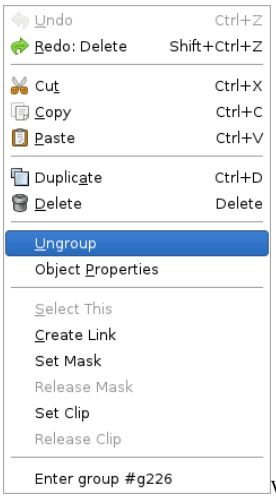
The obvious next step: open the PDF saved from R into Inkscape. You should see a window like in the image below.

PDF from R opened in Inkscape



Just as a heads up, if you work with a more detailed PDF with a lot of edges and nodes, Inkscape might crap out on you. For example, I tried loading the raw UFO map produced in the contour plot tutorial, which was only about 2.5 megabytes, and Inkscape crashed. It might just have been because there were so many points on the map though, since it was slow to navigate in Illustrator.

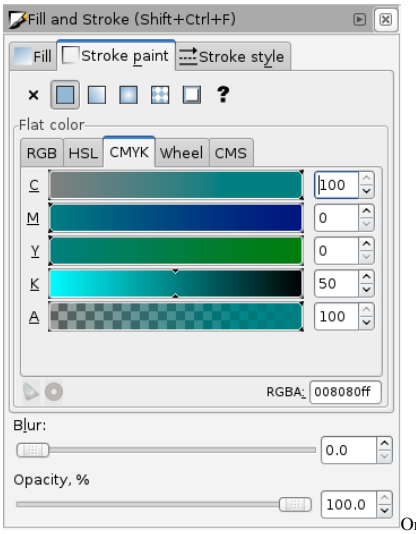
Ungroup Elements



When R makes a plot, it groups all the elements together so that it's like one object. You can ungroup them by right-clicking the plot and selecting Ungroup.

This step is more out of habit for me than a necessity. In Illustrator it's typically easier to ungroup elements to make it easier to manipulate individual elements. This still helped some in Inkscape, but wasn't as useful. I still recommend ungrouping though. It's easy.

Edit Stroke and Fill Colors

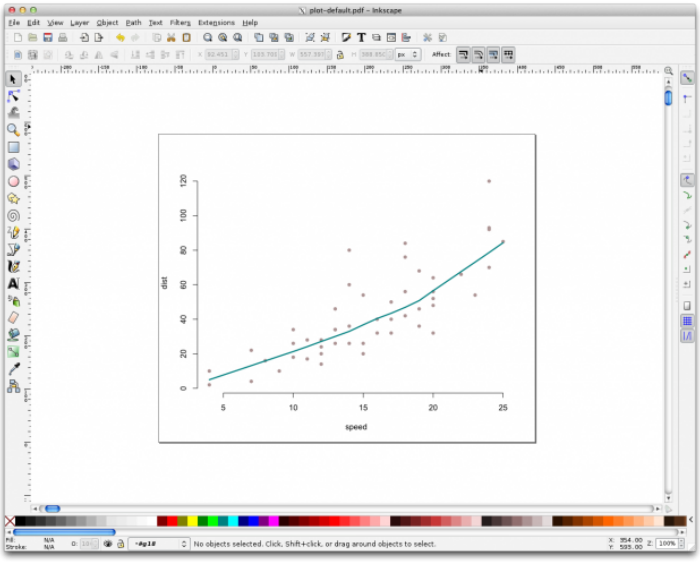


Once the graph is in, use the selection tool (the black arrow icon on the left) to click on what part of the graph you want to edit. Try clicking on the fitted line. Then a Fill and Stroke Window should appear. If it doesn't you can bring it up with `Shift + Control + F` or via the menu Object → Fill & Stroke…

Try out the different options. Mess with the fill color, the stroke style (e.g. width and edges), and stroke color. Do the same with the dots. Ideally you want to highlight the line and lessen the contrast of the dots (or the other way around to put focus on the individual points).

In any case, below shows the plot with a cyan-colored line with slightly increased thickness and grayish purple dots.

Changed colors of the line and dots

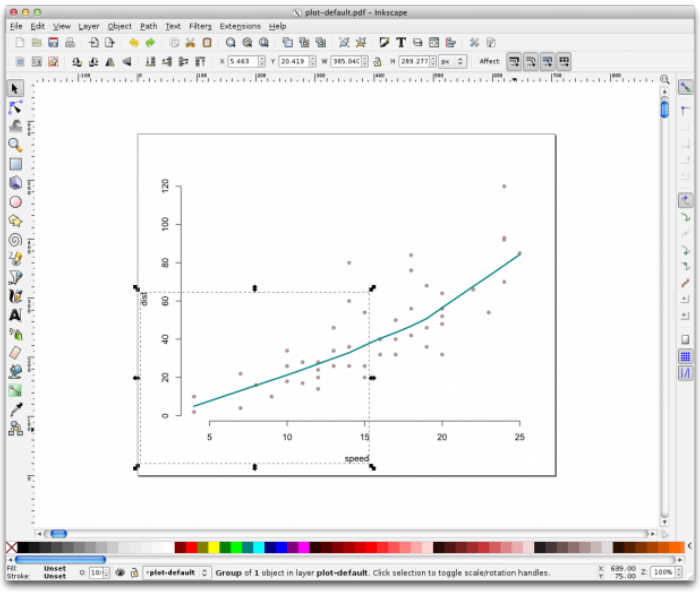


One weird thing I noticed was that objects wouldn't change color when I initially selected different shades. However, they did change after I randomly clicked the RGB, HSL, CMYK tabs, etc. I'm not sure why it worked that way.

Modify Labels

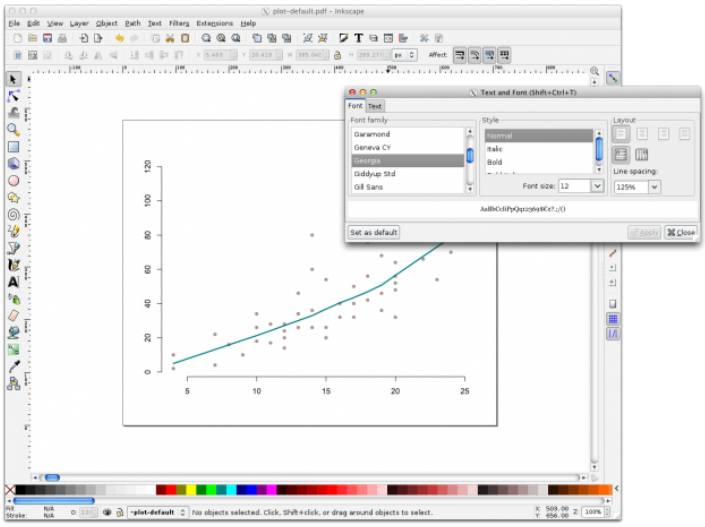
To edit the text, just click on it.

Selecting text for editing or delettion

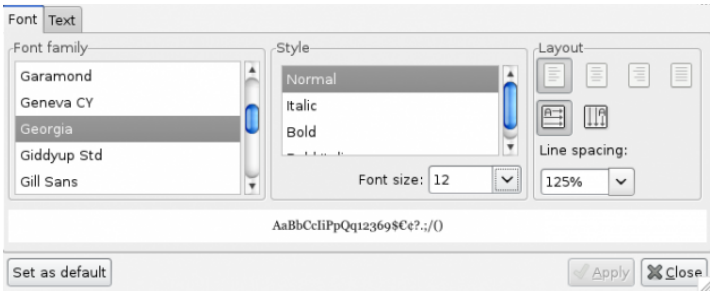


Personally, I like to include units right after the first value on both axes instead of putting them out there separately, so delete those (by pressing delete), and click on the icon with the big "A" in the left toolbar. This is the text tool which lets you, yeah, you guessed, put text on your graphic. Click where you want to put more text. It doesn't have to be exact since you can easily adjust later.

Standard text window for font family, size, and style

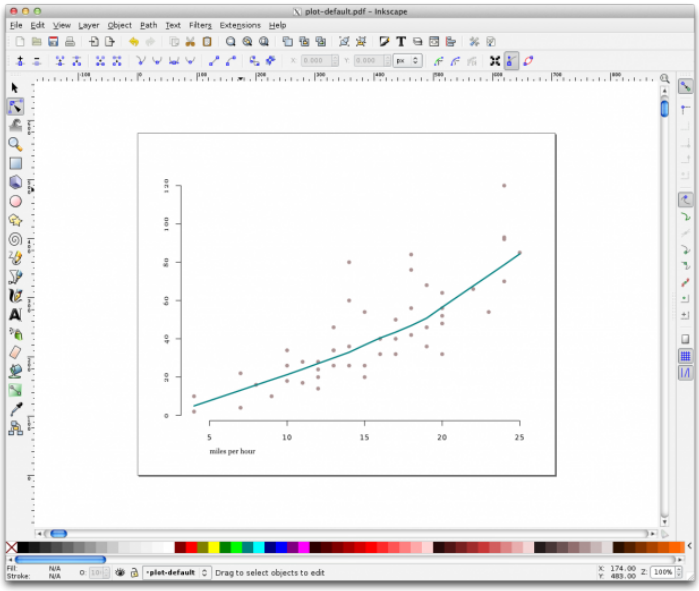


The text window, which includes font family, size, and style, should look familiar to you if you've ever used a word processor.

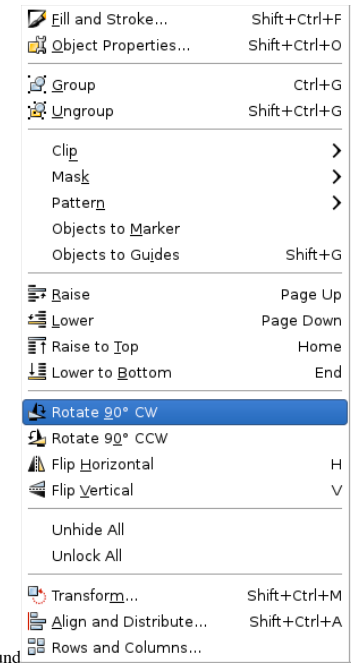


Type the desired text. In this case, it's miles per hour on the horizontal axis.

Change labels and text to your liking



The vertical axis labels could use some editing. I don't like how R rotates the numbers by 90 degrees, so use the direct selection tool (the black pointer icon below the big, black arrow in the left toolbar) to select each value in vertical axis. Then go to Object → Rotate 90° CW.

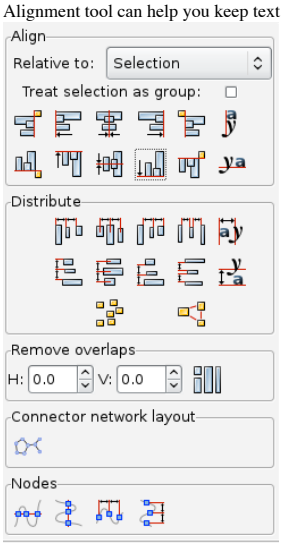


Rotate elements clockwise or the other way around

This'll get the labels turned around.

You can also use the align tool to straight out objects. The icon for this is in the top toolbar and looks like a horizontal bar graph. You can center objects, left align, right alight, and evenly distribute them. The best way to learn what they do is to try them out.

Alignment tool can help you keep text and graph elements straight and easy to scan

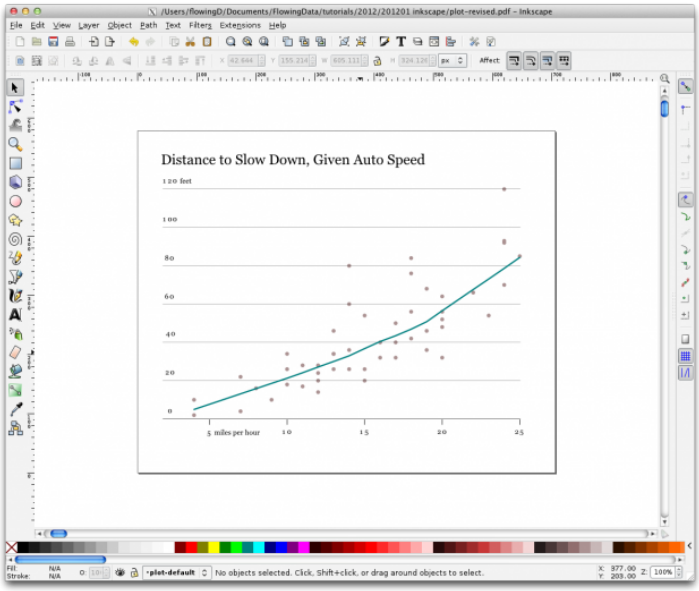


Add Other Elements

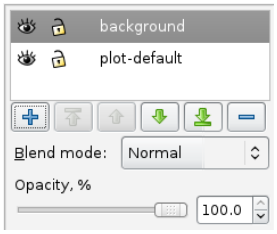
So far you edited existing elements like the dots and fitted line, but you can also add elements, and since it's a click interface, it's easy to click and experiment.

Try using the rectangle tool to make a background, or extend the tick marks to form gridlines.

Plot with gridlines, edited labels, and main title

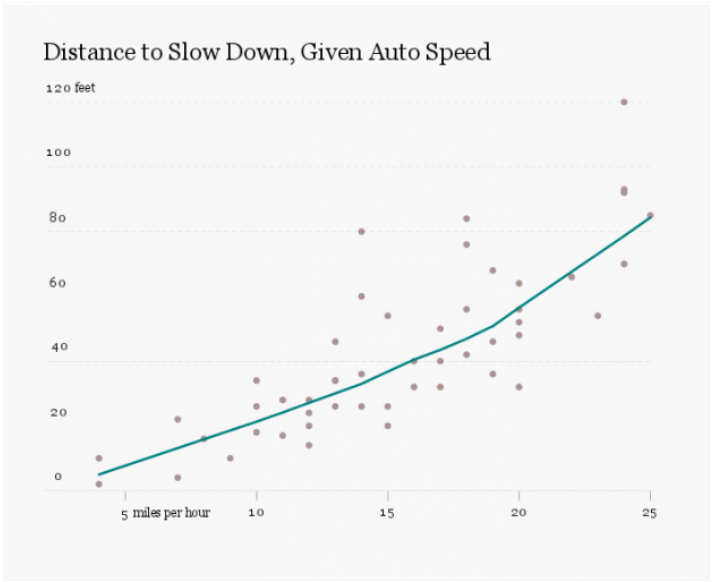


You'll probably notice that when you make a rectangle with a fill color that the new shape covers everything underneath. So you can instead make a new layer, put it below the plot layer, and that should do it. To see and edit layers: Layer → Layers…



And here's a finished plot. The changes were basic, but you get the idea. You can save as a PDF or export your new graphic in just about any format you like.

Output from Inkscape after basic edits to default plot in R



Wrapping Up

R is great for making graphs for analysis, and the defaults are basic enough that they don't get in your way as your scanning through a bunch of them. However, when it comes time to publish, it's almost always helpful to make some adjustments so that the graph is more readable or if you want to highlight certain areas. Once you get a hang of the general mechanics of Inkscape, the edits are pretty quick. The open-source vector graphics software isn't as good as Illustrator, but hey, it's free and should be just fine for those editing lightly.

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5 Comments (Add Yours)

About the Author

Nathan Yau is a statistician who works primarily with visualization. He earned his PhD in statistics from UCLA, is the author of two best-selling books — *Data Points* and *Visualize This* — and runs FlowingData. Introvert. Likes food. Likes beer.

- *Marcel Salikhov* — March 12, 2012 at 4:56 am

  Nathan, do you have any suggestion on how to batch to some extent a process of plot fine-tuning like this one ? As it's ok to manully edit a couple of plots for an article or a blog post. But if it's a heavy presentations with 20-30 plots, it becomes labour-consuming. You'd also want to keep the style of all the plots just the same.

  Reply
  - *Nathan Yau* — March 12, 2012 at 11:28 am

    @Marcel — I've never done it myself, but I know you can apply JavaScript to the SVG produced in Inkscape:

    http://wiki.inkscape.org/wiki/index.php/SVG_with_javascript

    But I guess if you're going to go the code route, it might be easier to mess with options and parameters in R.

    Another way to think about it is this is that newspapers and other publications edit charts and graphs in Illustrator every day, and it's usually done by different people, so it's possible to get the same style for all plots even if they're all hand-edited.

    Reply
- *Randall Coleman* — April 12, 2012 at 9:08 am

  Nathan,
  How do you get the horizontal lines to go across the graph? Also, when I uploaded the pdf each circle appears as a "q"? It's kinda weird.

  Reply
  - *Kristian Bysheim* — April 27, 2012 at 3:41 am

    @Randall I had the same problem with circles appearing as "q". I you use RStudio, you can export graphs as SVG-files, and the circles will appear as in the R graph.

    Reply
  - *Cesar Urteaga* — May 6, 2012 at 8:45 am

    If you use a not quite opaque colour (e.g. col=rgb(0, 0, 0, .99)) you won't have this problem. This solved the problem for me.

    You could try:

    plot(cars,col="red")
    plot(cars,col=rgb(0, 0, 0, .99))
    lines(lowess(cars))

    Reply

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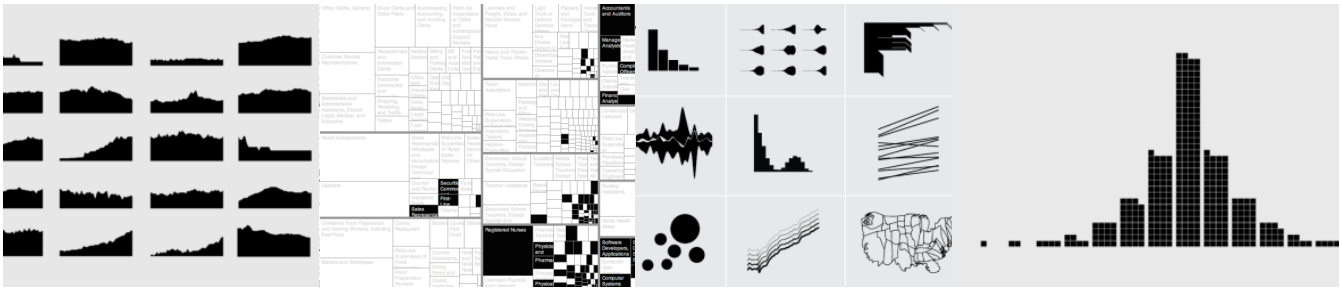

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