autoplotly - Automatic Generation of Interactive Visualizations for Popular Statistical Results

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Abstract autoplotly is an R package that provides functionalities to automatically generate interactive visualizations for many popular statistical results supported by ggfortify package with plotly.js and ggplot2 style. The generated visualizations can also be easily extended using ggplot2 syntax while staying interactive.

Introduction

Introductory section which may include references in parentheses (**?**), or cite a reference such as **?** in the text.

Background

Software Architecture

This section may contain a figure such as Figure 1.

Figure 1: The logo of R.

Illustrations

There will likely be several sections, perhaps including code snippets, such as:

```
autoplotly(prcomp(iris[c(1, 2, 3, 4)]), data = iris, frame = TRUE, colour = 'Species')
```

TODO: Hoverover metadata TODO: Zooming in details TODO: Extensibilty with ggplot2 TODO: Extensibility with plotly TODO: Exportability with export(p, "inst/images/iris_pca_full.png")

Forecasting packages such as **forecast** (Hyndman, 2015), **changepoint** (Killick et al., 2016), **strucchange** (Zeileis et al., 2002), and **dlm** (Petris, 2010), are popular choices for statisticians and researchers. Interactive visualizations of predictions and statistical results from those packages can be generated automatically using the functions provided by **autoplotly** with the help of **ggfortify**.

The **autoplotly** function automatically plots the change points with optimal positioning for the `AirPassengers` data set found in the **changepoint** package using the `cpt.meanvar` function, shown in Figure 3.

```
library(changepoint)
autoplotly(cpt.meanvar(AirPassengers))
```

The **autoplotly** function automatically plots the original and smoothed line from Kalman filter function in **dlm** package as shown in Figure 4.

```
library(dlm)
form <- function(theta){
  dlmModPoly(order = 1, dV = exp(theta[1]), dW = exp(theta[2]))
}
model <- form(dlmMLE(Nile, parm = c(1, 1), form)$par)
filtered <- dlmFilter(Nile, model)
autoplotly(filtered)
```

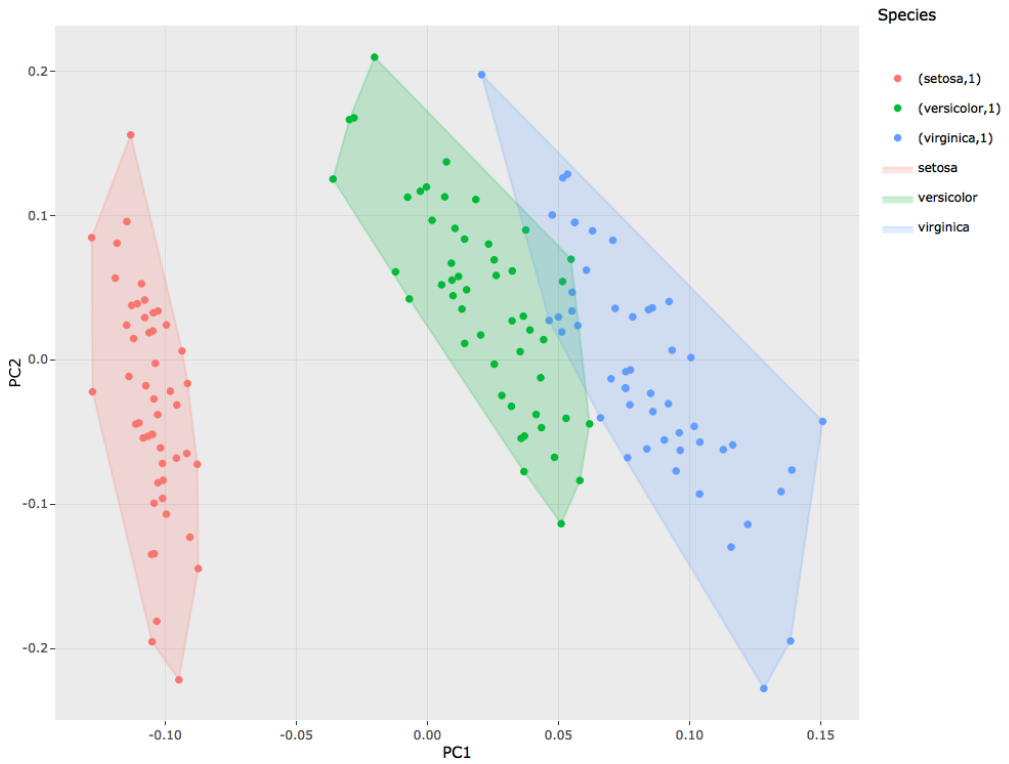

Figure 2: PCA with clolors and boundary for each class.

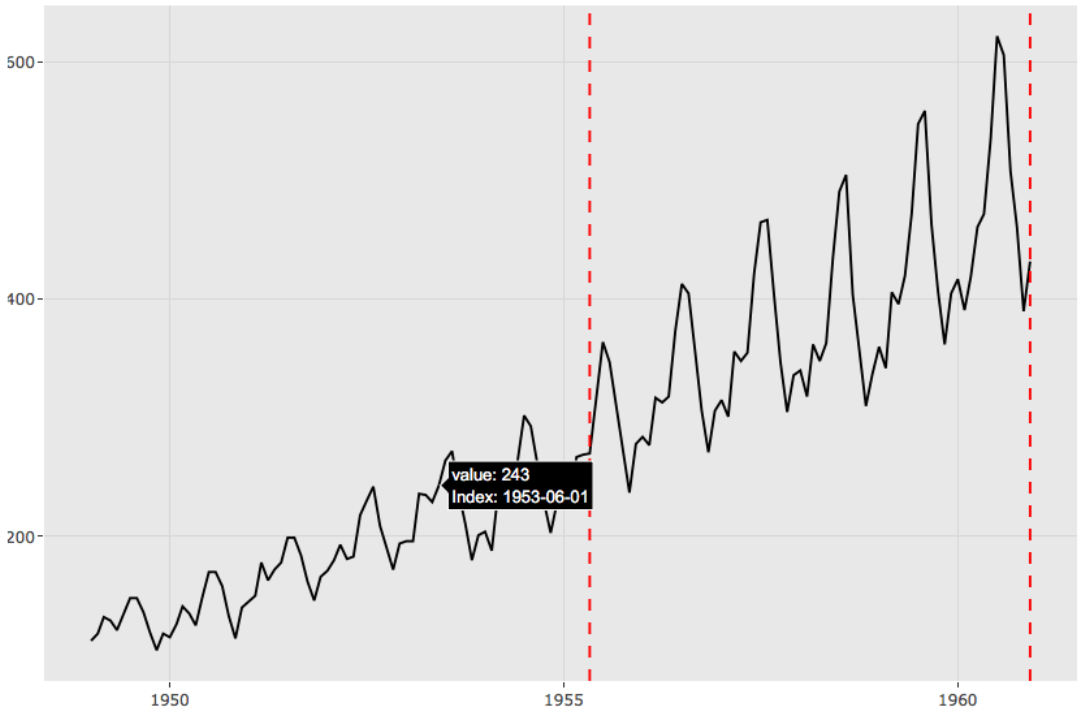

Figure 3: Change points with optimal positioning for AirPassengers.

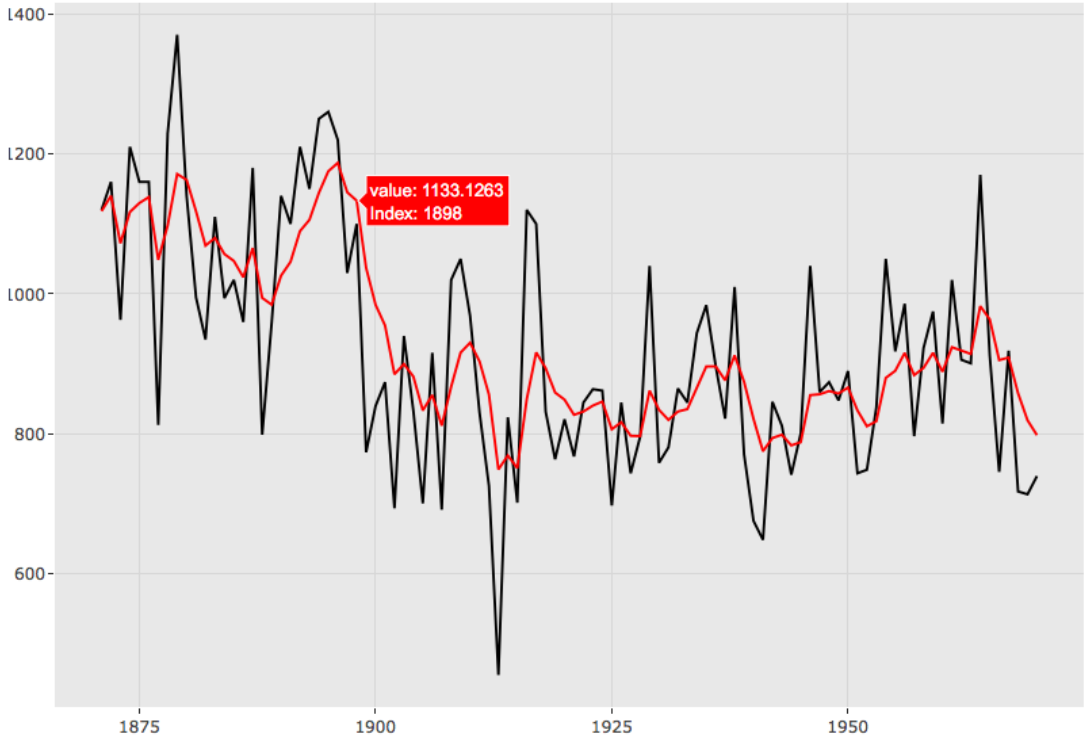

Figure 4: Smoothed time series by Kalman filter.

Additionally, **autoplotly** plots the optimal break points where possible structural changes happen in the regression models built by the `strucchange::breakpoints`, shown in Figure 5.

```
library(strucchange)
autoplotly(breakpoints(Nile ~ 1), ts.colour = "blue", ts.linetype = "dashed",
           cpt.colour = "dodgerblue3", cpt.linetype = "solid")
```

The `autoplotly` can also automatically generate interactive plots for results producuced by **splines**, shown in Figure 6

```
library(splines)
autoplotly(ns(diamonds$price, df = 6))
```

Summary

This file is only a basic article template. For full details of *The R Journal* style and information on how to prepare your article for submission, see the Instructions for Authors.

Bibliography

R. J. Hyndman. *forecast: Forecasting functions for time series and linear models*, 2015. URL `http://github.com/robjhyndman/forecast`. R package version 6.2. [p1]

R. Killick, K. Haynes, and I. A. Eckley. *changepoint: An R package for changepoint analysis*, 2016. URL `http://CRAN.R-project.org/package=changepoint`. R package version 2.2.1. [p1]

G. Petris. An R package for dynamic linear models. *Journal of Statistical Software*, 36(12):1–16, 2010. URL `http://www.jstatsoft.org/v36/i12/`. [p1]

A. Zeileis, F. Leisch, K. Hornik, and C. Kleiber. strucchange: An R package for testing for structural change in linear regression models. *Journal of Statistical Software*, 7(2):1–38, 2002. URL `http://www.jstatsoft.org/v07/i02/`. [p1]

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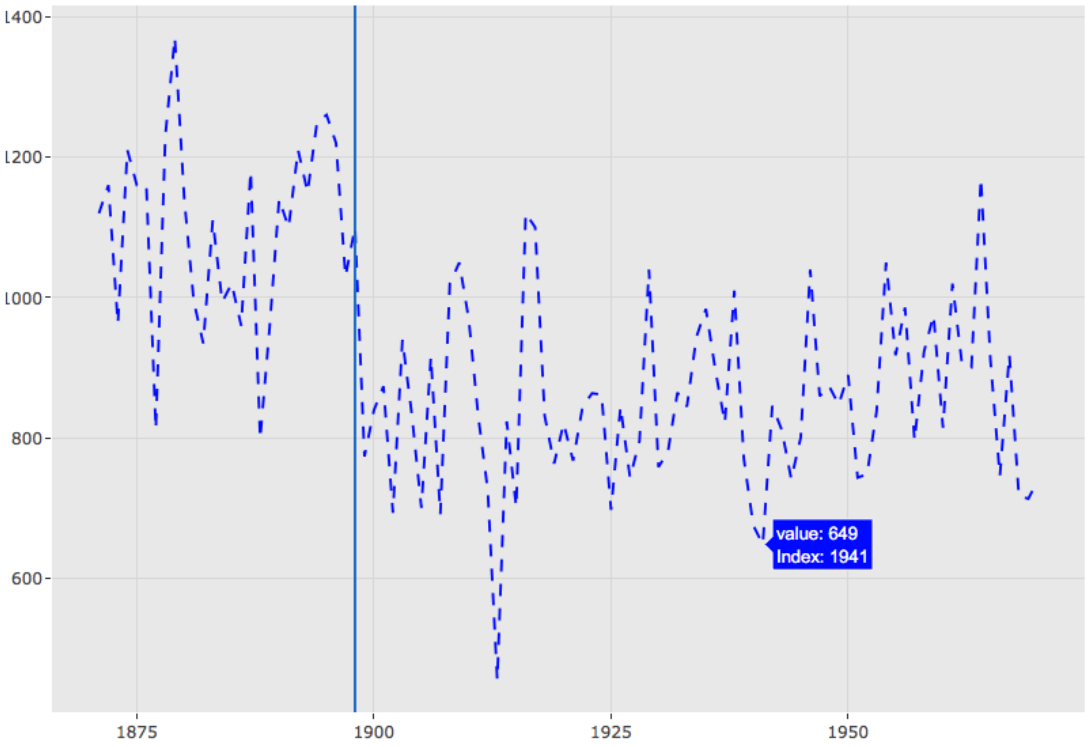

Figure 5: Optimal break points with possible structural changes.

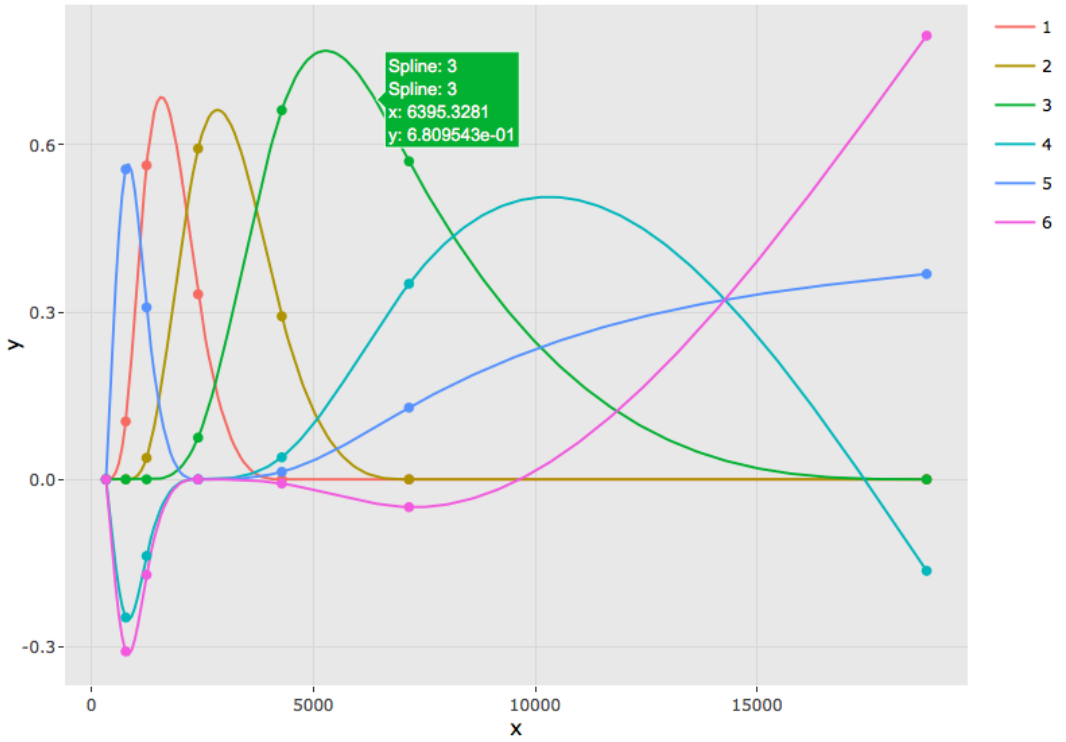

Figure 6: B-spline basis points for natural cubic spline with boundary knots.

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