mpitb: A toolbox for calculating multidimensional poverty indices in R

by Ignacio Girela

Abstract (An abstract of less than 150 words.) This article presents mpitb, an integrated framework for calculating multidimensional poverty indices (MPIs). This package supports the popular Alkire-Foster framework for measuring multidimensional poverty.

Introduction

Although poverty is widely understood as the inability to achieve basic standards of living, the measurement of poverty has traditionally been based on monetary deficits. However, over the past two decades, there has been a significant increase in the use of multidimensional approaches to measuring poverty in an attempt to capture different aspects of this phenomenon. In this context, the measurement method proposed by Alkire and Foster (2011) (AF, hereafter) has become notably popular due to its flexibility and ability to inform policy. For instance, the well-known global Multidimensional Poverty Index (MPI), yearly published by the OPHI and the UNDP, is based on the AF method. Furthermore, many countries are developing their own MPIs to track poverty reduction progress using the AF method.

Although this method is increasingly popular, calculating AF measures in practice is still a challenging task due to the lack of a unified and integrated framework on how to produce, analyse and present different estimates. Motivated by this issue, OPHI has recently launched a Stata package (Suppa 2023) to provide [...]. This package seeks to adapt this framework to R users.

Some R packages that computes AF measures include **MPI** (Kukiattikun and Chainarong 2022) [...]. Notwithstanding, these packages do not consider the survey structure from which household surveys affecting the estimation of standard errors and, consequently, affecting subsequent statistical inference.

This paper will first review some R packages on interactive graphics and their tooltip implementations. A new package **ToOoOlTiPs** that provides customized tooltips for plot, is introduced. Some example plots will then be given to showcase how these tooltips help users to better read the graphics.

Measuring multidimensional poverty: the Alkire-Foster Method

Customizing tooltip design with ToOoOlTiPs

ToOoOlTiPs is a packages for customizing tooltips in interactive graphics, it features these possibilities.

A gallery of tooltips examples

The **palmerpenguins** data (Horst, Hill, and Gorman 2020) features three penguin species which has a lovely illustration by Alison Horst in Figure 1.

Table 1 prints at the first few rows of the `penguins` data:

Figure 2 shows an plot of the penguins data, made using the **ggplot2** package.

```
penguins %>%
  ggplot(aes(x = bill_depth_mm, y = bill_length_mm,
```

Table 1: A basic table

species	island	bill_length_mm	bill_depth_mm	flipper_length_mm	body_mass_g	sex	year
Adelie	Torgersen	39.1	18.7	181	3750	male	2007
Adelie	Torgersen	39.5	17.4	186	3800	female	2007
Adelie	Torgersen	40.3	18.0	195	3250	female	2007
Adelie	Torgersen	NA	NA	NA	NA	NA	2007
Adelie	Torgersen	36.7	19.3	193	3450	female	2007
Adelie	Torgersen	39.3	20.6	190	3650	male	2007

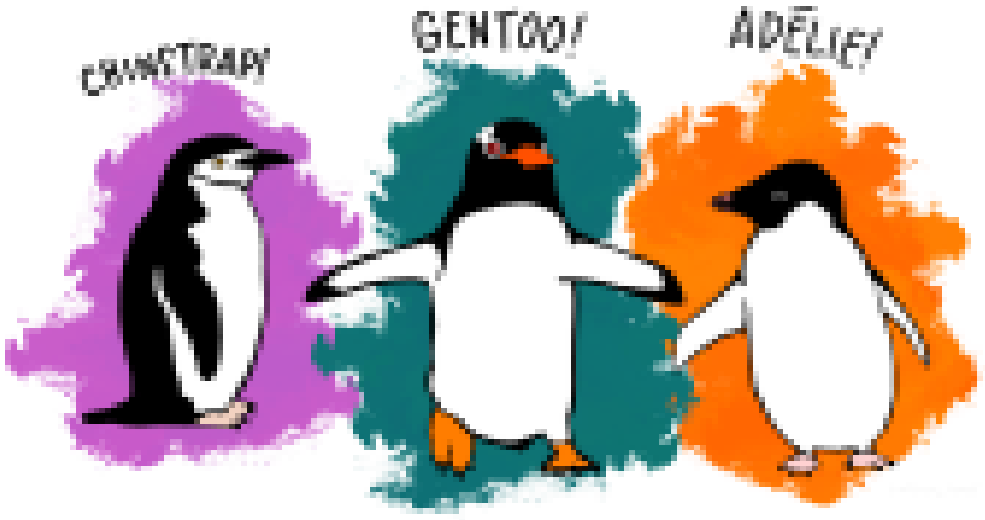

Figure 1: Artwork by allison_horst

```
            color = species)) +
  geom_point()
```

Summary

We have displayed various tooltips that are available in the package **ToOoOlTiPs**.

References

Alkire, Sabina, and J. E. Foster. 2011. "Counting and Multidimensional Poverty Measurement." *Journal of Public Economics* 95 (7): 476–87.

Horst, Allison Marie, Alison Presmanes Hill, and Kristen B Gorman. 2020. *palmerpenguins: Palmer Archipelago (Antarctica) Penguin Data*. https://allisonhorst.github.io/palmerpenguins/.

Kukiattikun, Kittiya, and Chainarong Chainarong. 2022. *MPI: Computation of Multidimensional Poverty Index (MPI)*. https://CRAN.R-project.org/package=MPI.

Suppa, Nicolai. 2023. "mpitb: A Toolbox for Multidimensional Poverty Indices." *The Stata Journal* 23 (3): 625–57. https://doi.org/10.1177/1536867X231195286.

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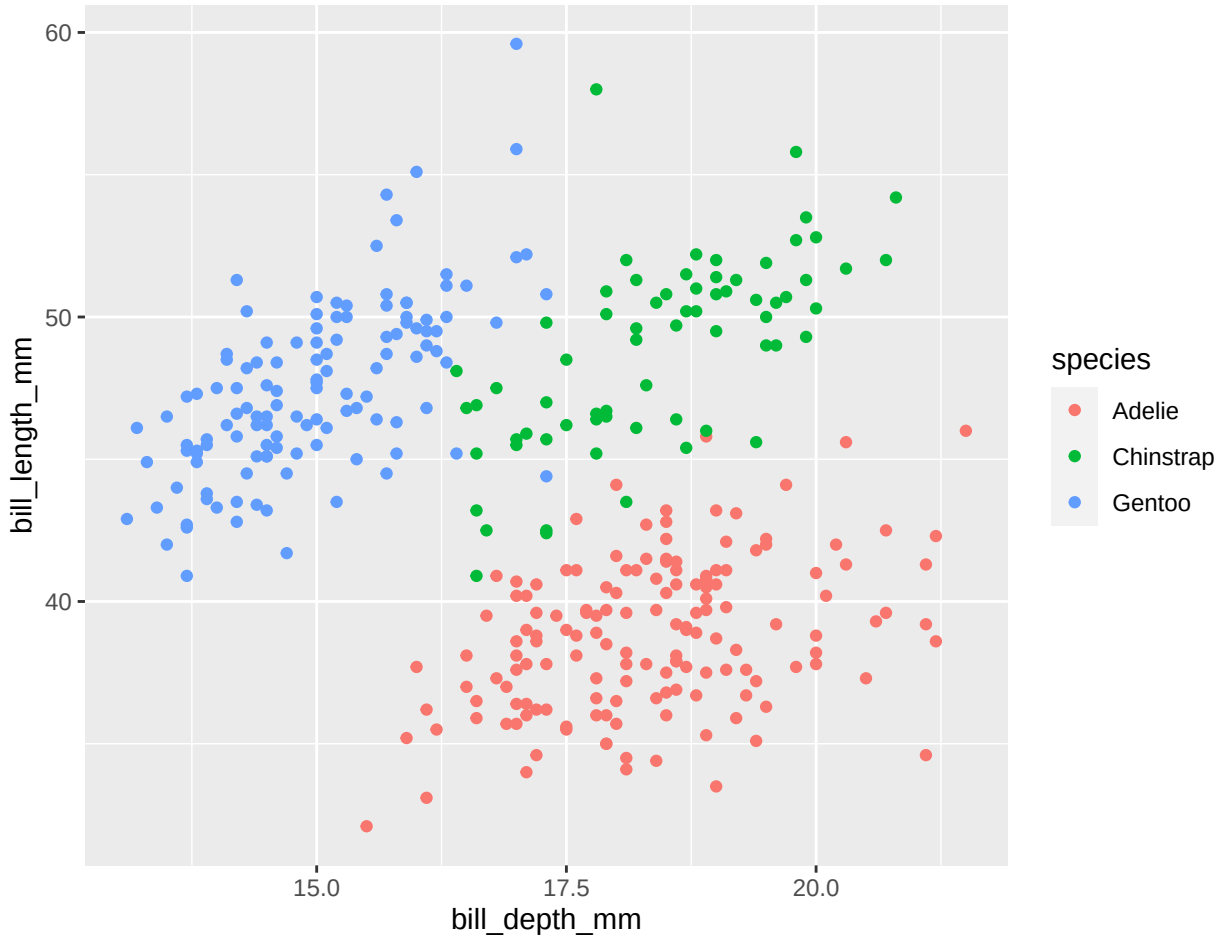

Figure 2: A basic non-interactive plot made with the ggplot2 package on palmer penguin data. Three species of penguins are plotted with bill depth on the x-axis and bill length on the y-axis. Visit the online article to access the interactive version made with the plotly package.