

Thanks to the three reviewers for some very helpful comments which have led to many improvements of the paper. My response are in black, the reviewers' comments are in red.

## Reviewer 1 comments

## Reviewer 2 comments

p.10, l.1-15 It wasn't clear to me why the subtraction was performed in the equation (2) because I couldn't find any description for the global coordinate system of the canvas. The value of  $y$  could be negative. Please add the description how to deal with the coordinate system, especially the  $y$ -axis.

The reason why the subtraction is performed was originally given in the following paragraph of Equation (2).

## Reviewer 3 comments

p1, l32: 'information, and events.' - remove the comma

We have removed the comma and elsewhere, and adjusted the language based on the comments.

p2, l9: 'grammar of graphics' - provide reference immediately here and not only later in the article and explain what the grammar of graphics is; also 'piped into' may not be understood by outsiders

Done.

Fig.1 (& related figs): I suppose you use a '3-class Dark2' color scheme from Rcolorbrewer? This does not work well when printed in gray scale: The colors become almost indistinguishable. ...

We have changed the colour scheme from 'Dark2' to '4-class PuOr' (without faint orange) in Figure 1 and all consecutive figures.

Fig.4: Colors orange & purple are hard to distinguish in grayscale. Moreover, you should use different colors here as these 2 colors are already related to the 3 stations.

We have changed the colour to red and blue picked from a '4-class RdYlBu' colour scheme, which is different from the colours used for the 3 stations.

Fig.2: Instead of 'Jan 2016' ... 'Jan 2017', be specific and list 'Jan 1, 2016' ... 'Jan 1, 2017'

Done.

Fig.2: Can you match the minor grid lines with the start of a month, rather than the middle of a month? This will make it much easier to identify the approximate dates for some of the other spikes. No need to label these minor grid lines.

Done.

Fig.2: You mention 'small multiples' only in a figure caption. This concept is a central part of your calendar graphics and should be summarized in more details (including references) in the main text. Also mention Unwin & Valero-Mora's 'Ensemble Graphics', JCGS, 27(1), as a major concept that applies to both sets of related figures in your article.

ToDo

Fig.3: Add tick marks at 0 and 24. See whether tick mark labels fit. If not, OK to omit those for 0 and 24.

Done.

p6, l8: You mention ggTimeSeries & ggcal. For completeness, also cite Jones (2016) Calendar Heatmaps, <https://rpubs.com/haj3/calheatmap>, and possibly Wong's TimeProjection R package, <https://cran.r-project.org/web/packages/TimeProjection/index.html>

Done.

p6, l49-...: Starting a section called 'Data transformation' with an example/figure seems to be strange. Can you first start with the formal steps and then place this example/figure after the formal part, i.e., around p.8, l38.

Done.

Fig.4: Colors orange & purple are hard to distinguish in grayscale. Moreover, you should use different colors here as these 2 colors are already related to the 3 stations.

Done.

Fig.4: Prior to reading the text on p8, I was really confused and even assumed there was a major bug in your R code. Having 2 days in early May and 1 day in early Oct, then 3 days missing, and then the remainder of the month is really confusing for someone who only looks at the figure without reading the text in detail. At least mention this layout anomaly in the figure caption.

Thanks. I have pointed out the layout anomalies for May and October in the Figure 6 caption (previously Figure 4).

p8, l19: 'wrap the last few days up to the top row of the block': This answers my comment for Fig.4 now, but this layout still remains misleading. We expect to see some similar temporal pattern in nearby graphs. But there could be considerable differences over a 30-day period, e.g., in your example from Section 3: What if these 1 or 2 days are after some summer vacation with lots of air conditioning use, but the vacation already started in the previous month and continued through the middle of the current month. Suddenly, there will be a few huge spikes that interrupt the overall low-energy pattern. I could think of 2 possible solutions: (i) Add a 6th week for each month; or (ii) Add the extra days to the start of the next month. This is sometimes called a 'Calendar Heatmap Tetris Chart', see for example <https://stackoverflow.com/questions/27000131/calendar-heat-map-tetris-chart> [both of these features could become additional user options for your R function]

ToDo.

p8, l44: 'Between each month requires some small amount of white space, denoted by b.' - strange sentence; rephrase

Done.

p11, l44: 'star plots': briefly explain what these are and cite a basic reference for these.

Done.

Fig.7: Where is 'noon' and 'midnight' here - on top/bottom or on the 0/180 degree position on the right/left side? And what is the direction? I suppose clockwise, but this needs to be mentioned somewhere.

The start plots have been removed from the paper, since it doesn't add more information to other existing plots.

p13, l28: 'swapped in the Equation 1.' -> 'swapped in Equation (1).'

Done.

p13, l39: 'Figure 13 shows the same plot as Figure 12 labelled': You can't jump forward to a figure before all intermediate figures have been introduced. The previous fig was Fig.8. Figs 9-11 have not been mentioned yet. Either rearrange your figures so that 12-13 become 9-10, or use Chinese characters for one of the previously introduced figs (1-8).

Sure. 'Figure 13 shows the same plot as Figure 12 labelled' is deleted.

p13, possible subsection 2.2.6: You seem to have a 'sunday = FALSE' default. If TRUE, does this make Sunday the start of the week (as used in the US & Canada)? If so, mention this as an option. No need for a figure.

Done. More to fill in the section

p13, possible subsection 2.2.7: How can you enter specific holidays? These are different from country to country, e.g., based on national holidays such as Thanksgiving, Labor Day, independence days, religious holidays, etc.

ToDo.

Fig.8: 'impossible to compare the size of peaks between days.' - Correct; since this is based on ggplot, could you use colors from a sequential color scheme that maps the counts, e.g., from faint yellow (0) to dark red (for the overall max)? This might be another useful argument for a future extension of your function.

ToDo.

p15, l5: 'distinct temporal trend' -> 'distinct temporal pattern'

Done.

p15, l12: 'idea of faceting': explain what 'faceting' means in general (and cite 1 or 2 main references)

ToDo.

p15, l16: 'In particular, it can be immediately learned that when Birrarung Marr was busy and packed, for example Australian Open in the last two weeks of January.' -> 'In particular, it can be immediately learned that Birrarung Marr was busy and packed, for example during the Australian Open, a major international tennis tournament, in the last two weeks of January.'

Done.

p15, l45: 'the day before Christmas, go shopping on the Boxing day, and stay out for the fireworks on New Year's Eve.': Some of these names may not be known to non-Christian / non-British readers. List the date in parentheses, e.g., December 24, December 26, etc.

Done.