Visualizing QS Data Using Time Spirals

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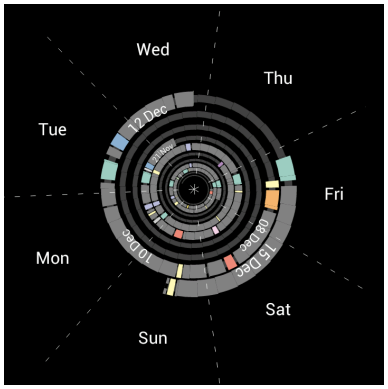
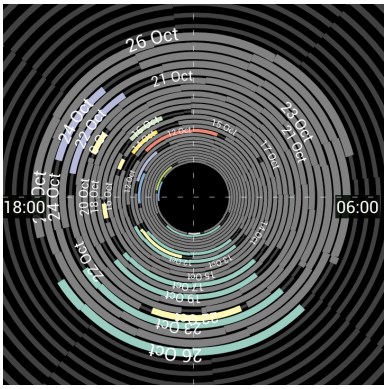
BACKGROUND AND METHOD

An inherent property of most self-tracking data is the repetitions and re-occurring events on different temporal scales, including days, weeks, months, and years. We propose an interactive time spiral visualization technique for visualizing time series data aiming to capture the continuous property of QS data, while also emphasizing the reoccurrences of events on multiple time scales. The time spiral concept builds on top of a clock-dial metaphor with a circle corresponding to a arbitrary time span (e.g. hour, day, week). The continuity of the time series data is captured by the continuous spiral timeline with the present in the outer ring and the past towards the center. The time spiral visualization supports the user in exploring repetitive patterns, but also to observe deviations, irregularities, and changes over time. Possible configurations of the time spiral visualization is shown below.

week view

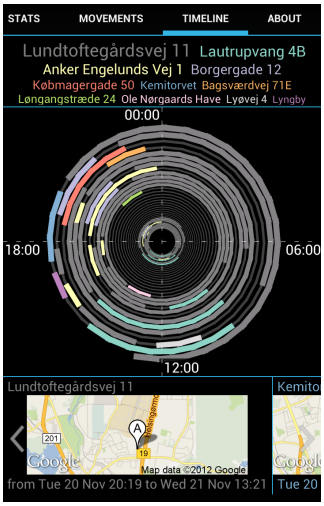


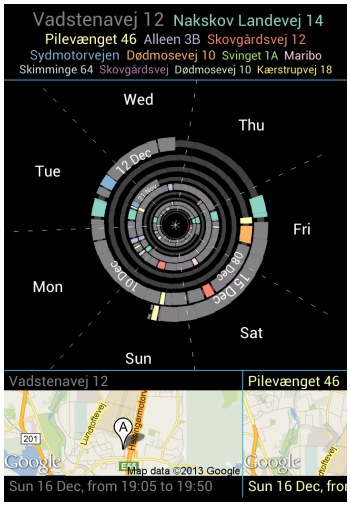


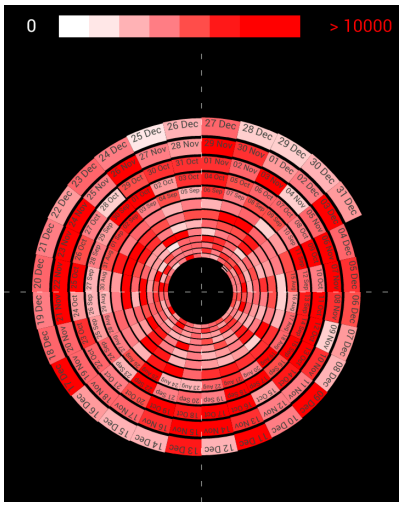
24 hour view

CASE STUDIES: DATA AND VISUALIZATIONS

We illustrate the capabilities of the visualization method by visualizing two different QS time series data sets with different configurations. One data sets covers mobility (smartphone GPS traces) where recognized places are color coded and presented in the spiral view. The time spiral is combined with map segments of the places (see below). The other data set is physical activity (FitBit data), where number of daily steps is color coded from white (0 steps) to dark red (above 10000 steps). Here a 4-week view allows a compact visualization of an entire year of FitBit data. In the examples data points are shown as a color coded timeline, but symbols or animations could be used instead.







CONCLUSIONS

- It has been shown by example that the spiral visualization can capture both the continuous and repetitive aspects of self-tracking data sets and facilitate exploration
- In both cases it was found that the periodic events and daily/weekly rhythms were discoverable and that the repetitive data makes deviations stand out clearly
- We have yet to explore the full potential of this visualization method by trying different configurations and experimenting with other types and multiple QS data sets

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