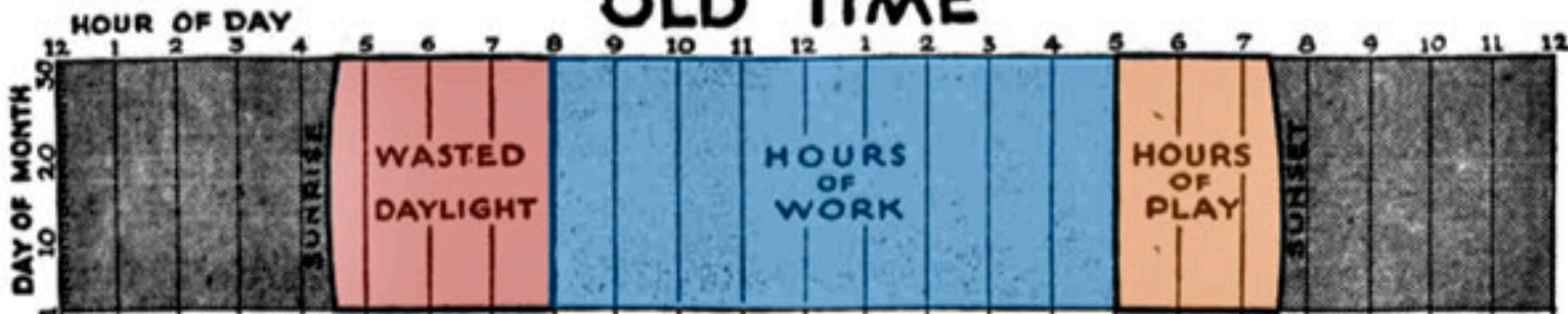


Time Series

What Setting the Clock Ahead Will Mean to You

ONE LESS DAYLIGHT HOUR WASTED IN THE MORNING—ONE MORE HOUR OF SUNLIGHT ADDED TO YOUR RECREATION WHEN YOUR DAY'S WORK IS DONE.

OLD TIME



DAYLIGHT SAVING TIME



70% of business data

Time Series Data Properties

- Discrete vs. interval
- Linear vs. cyclical
- Ordinal vs. continuous
- Ordered vs. branching vs. multiple perspectives

Characteristics of Change

Magnitude

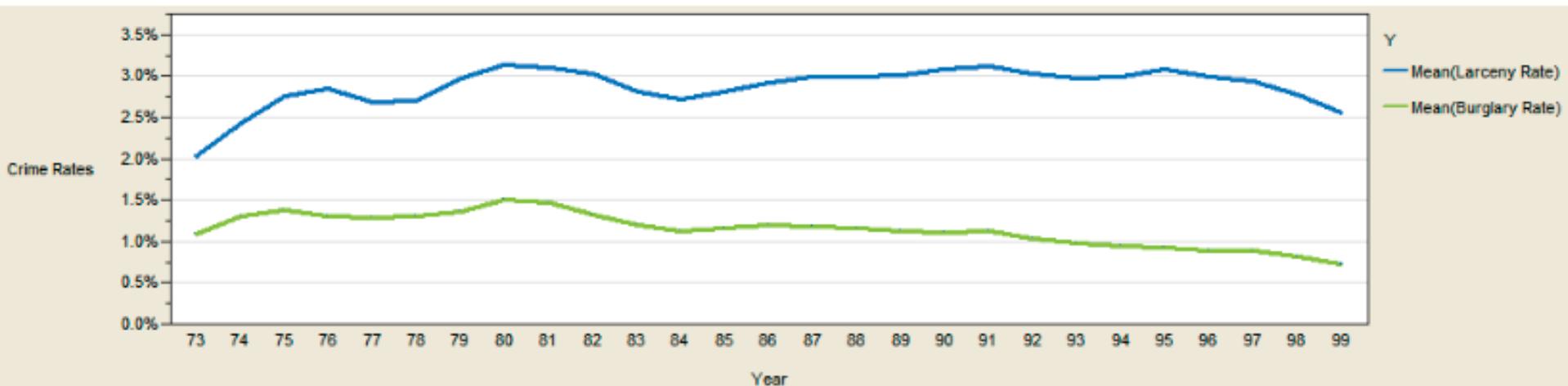


Chart source: Few, 2007. *Visualizing change*.

Shape

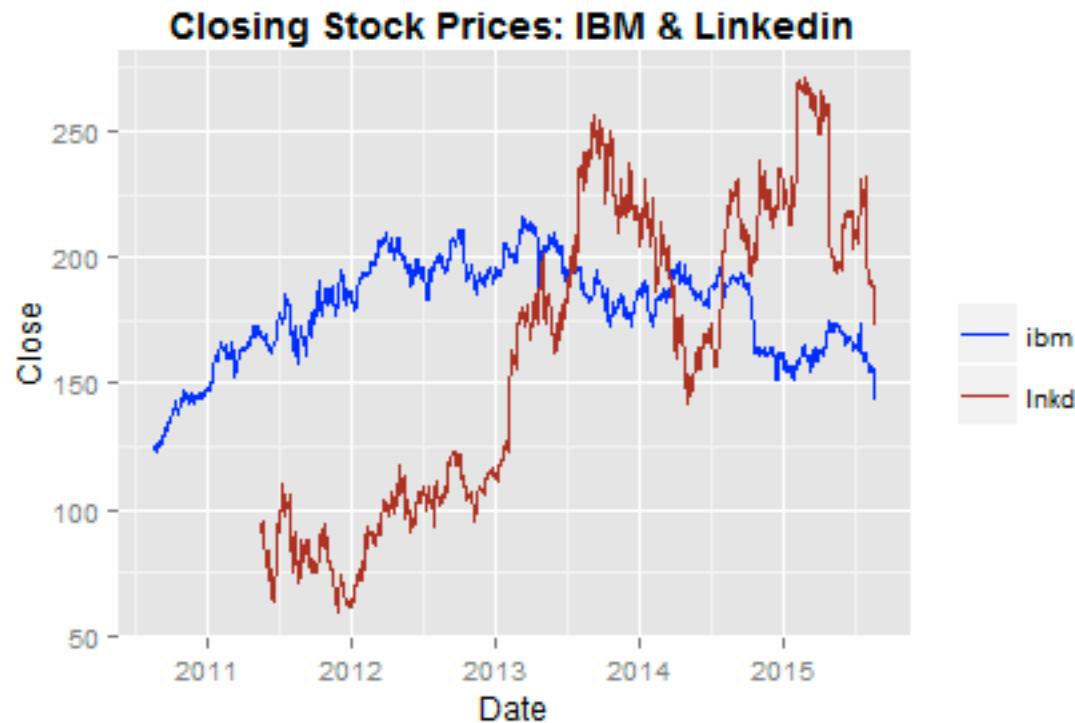


Chart source: <https://www.r-bloggers.com/plotting-time-series-in-r-using-yahoo-finance-data/>

Velocity

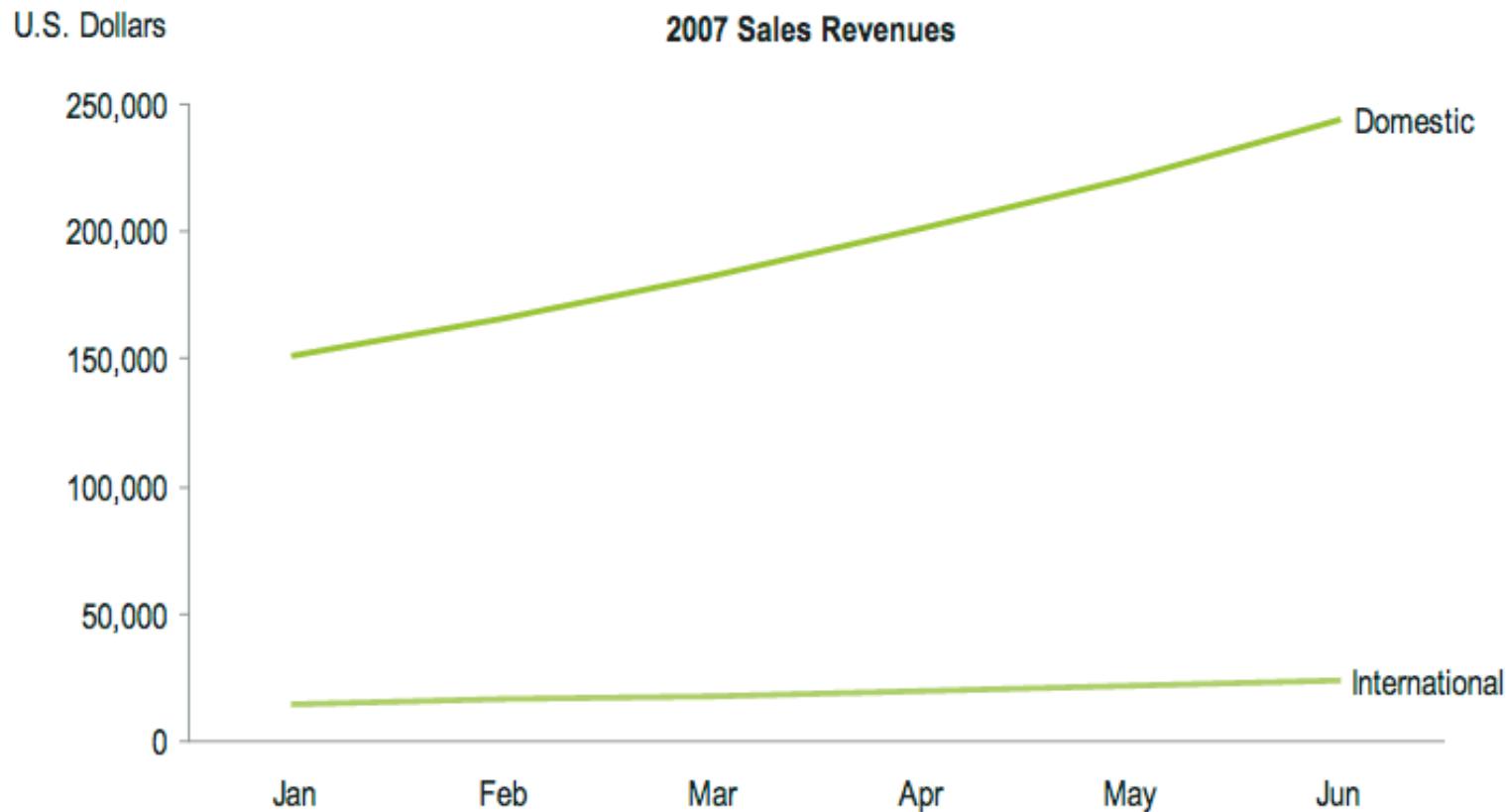


Chart source: Few, 2007. *Visualizing change*.

Direction

U.S. Dollars

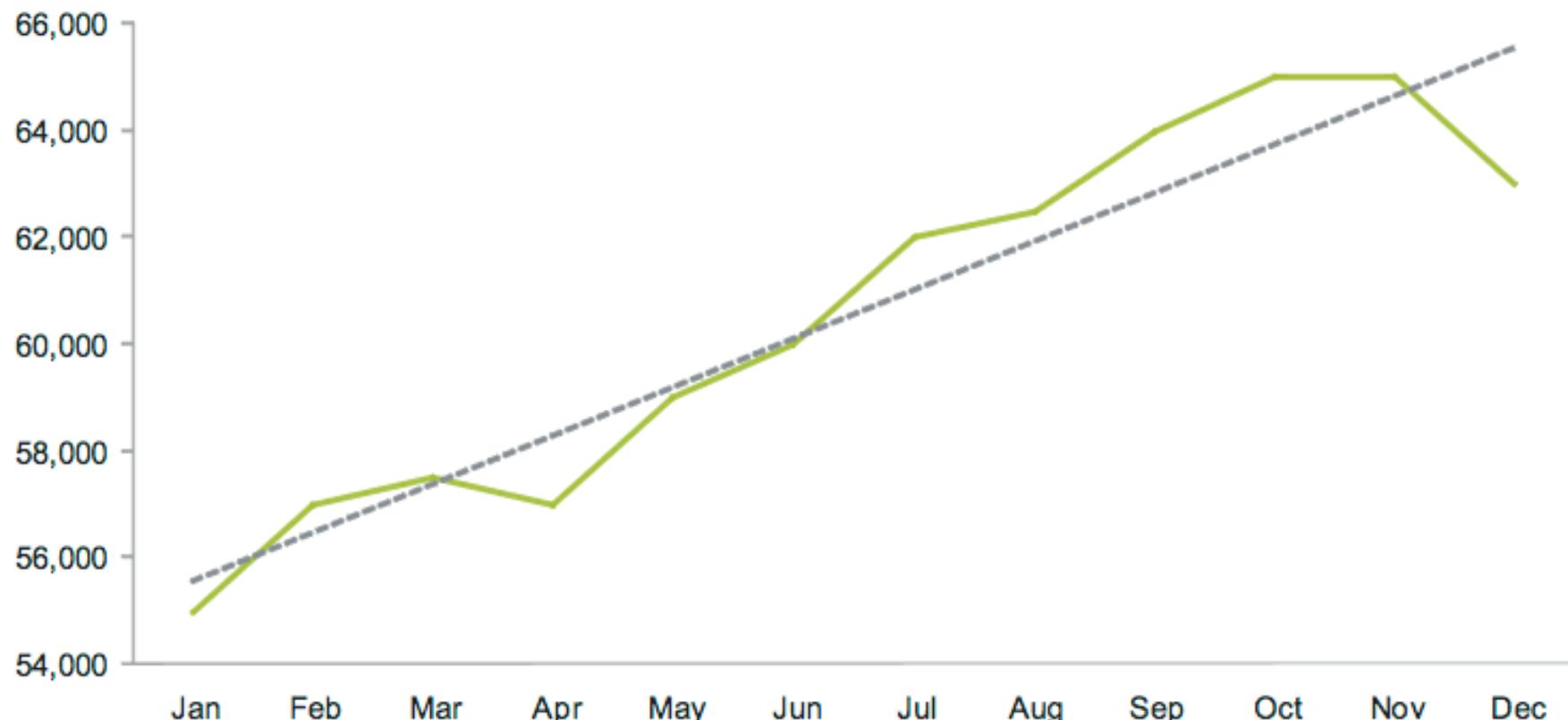


Chart source: Few, 2007. *Visualizing change*.

Motion

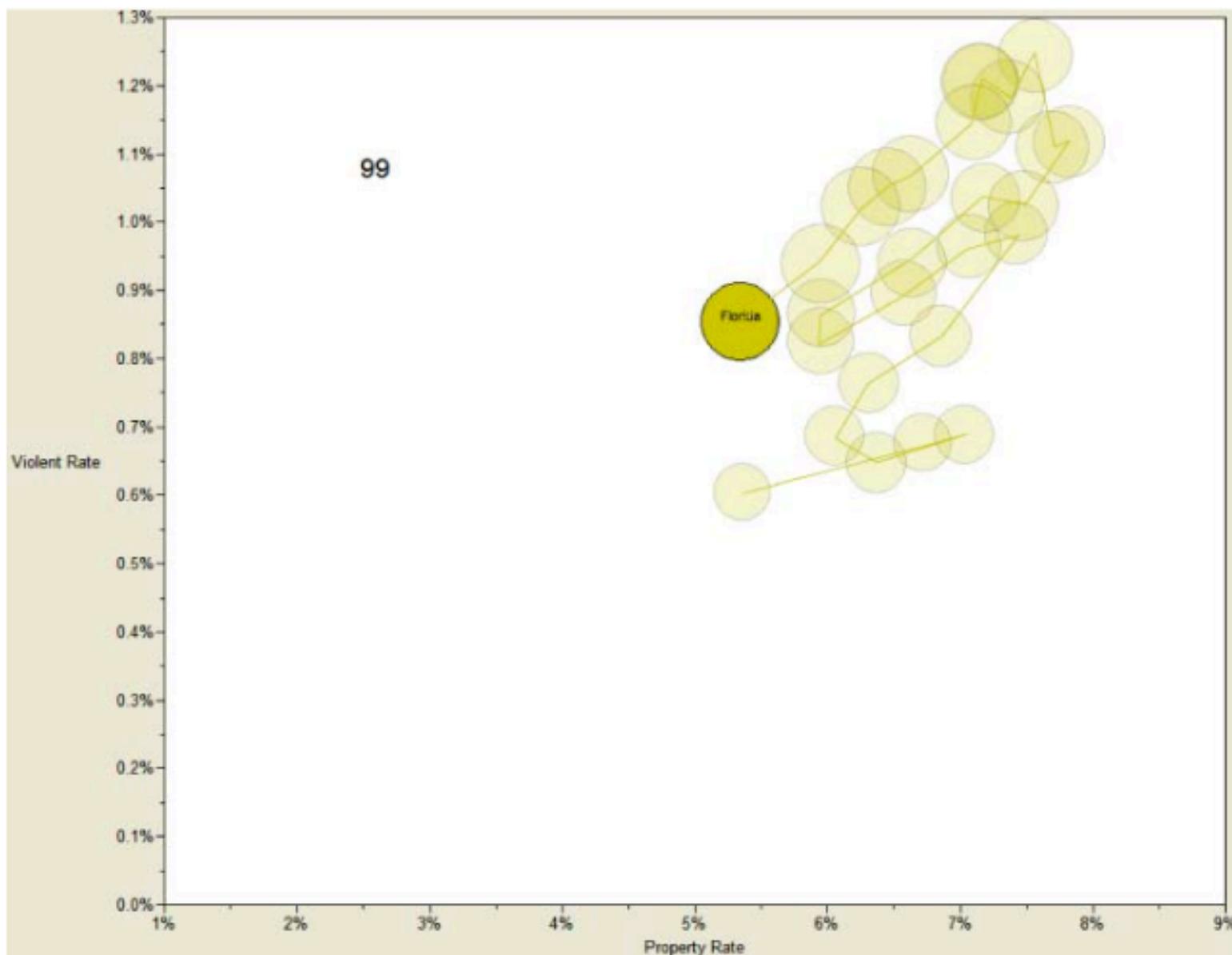


Chart source: Few, 2007. *Visualizing change*.

Linear

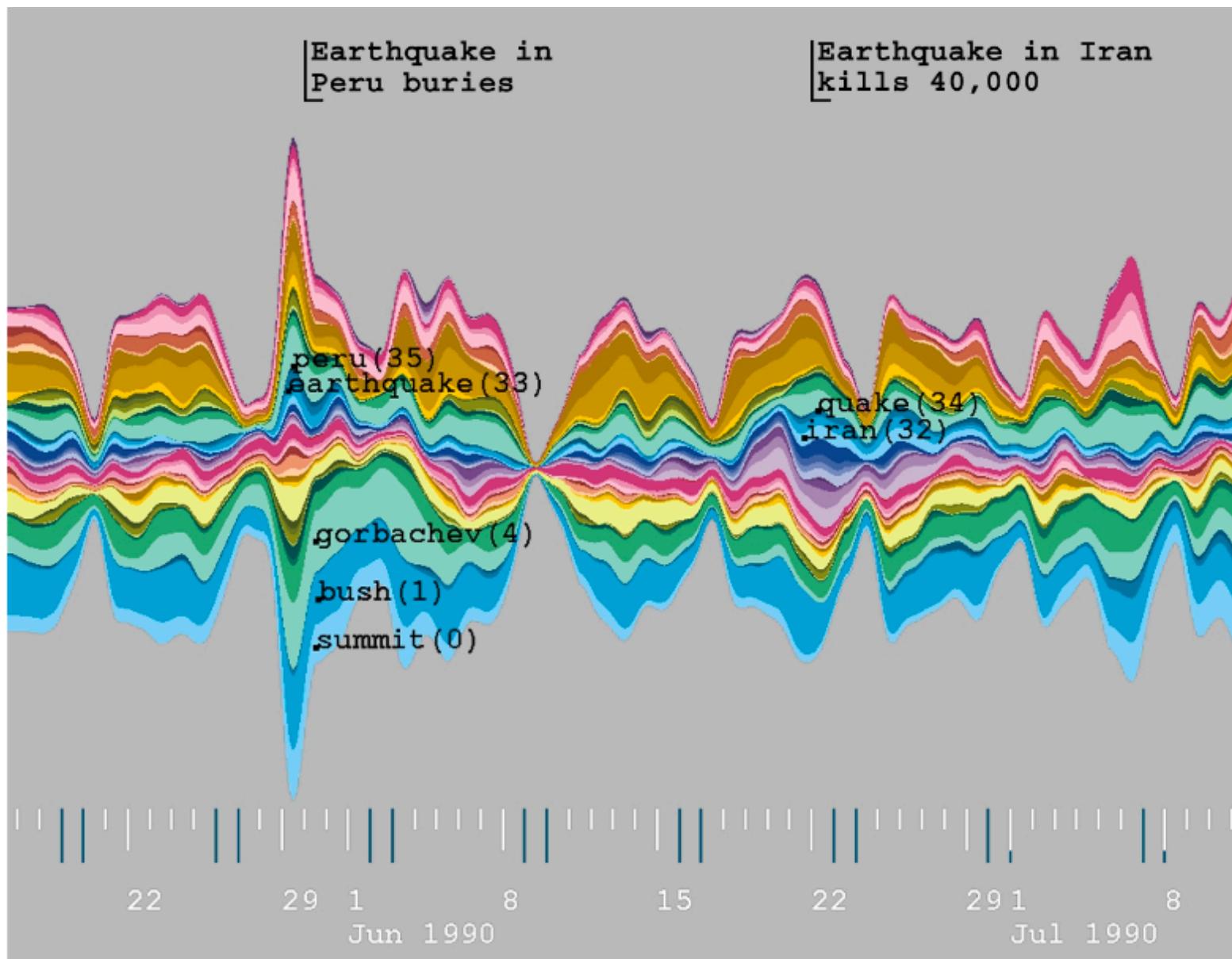


Chart source: Havre et al., 2000. *ThemeRiver: Visualizing theme changes over time.*

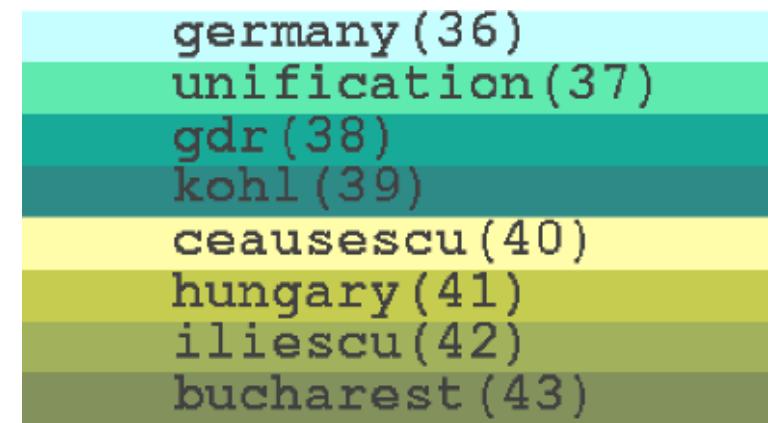
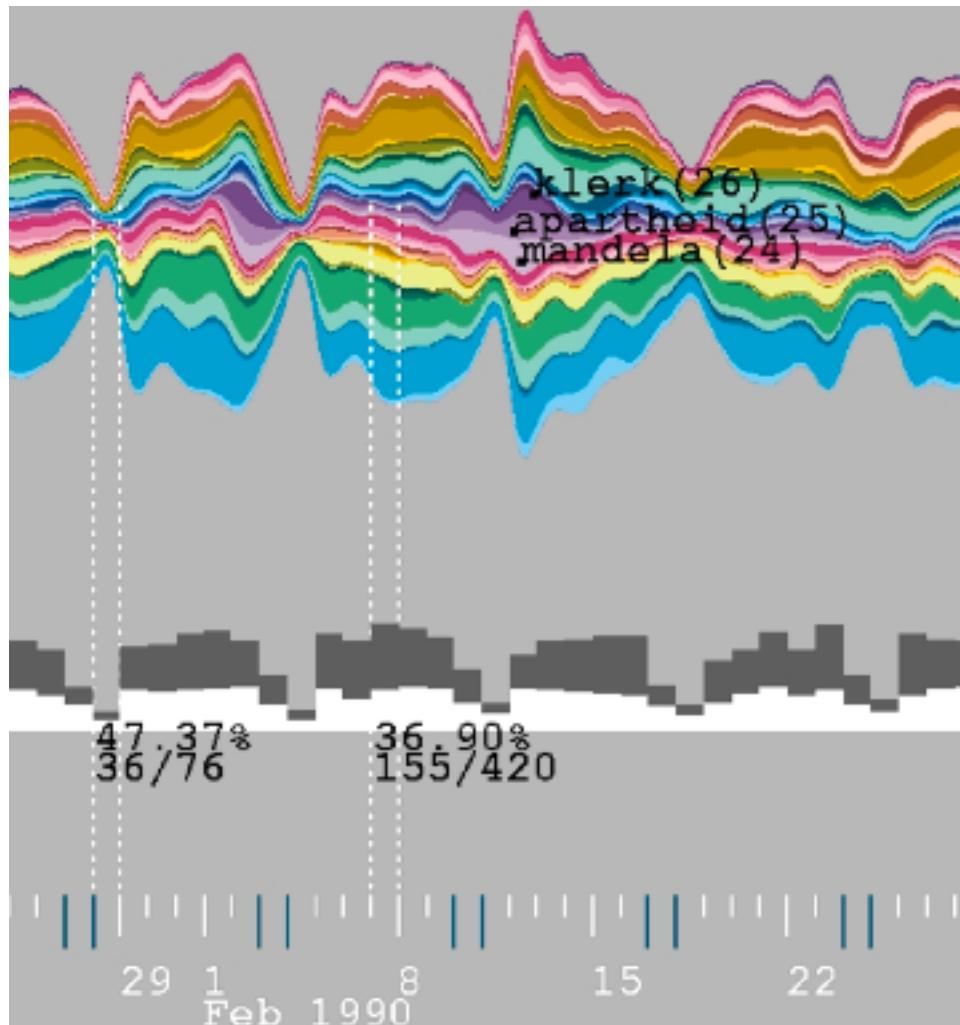
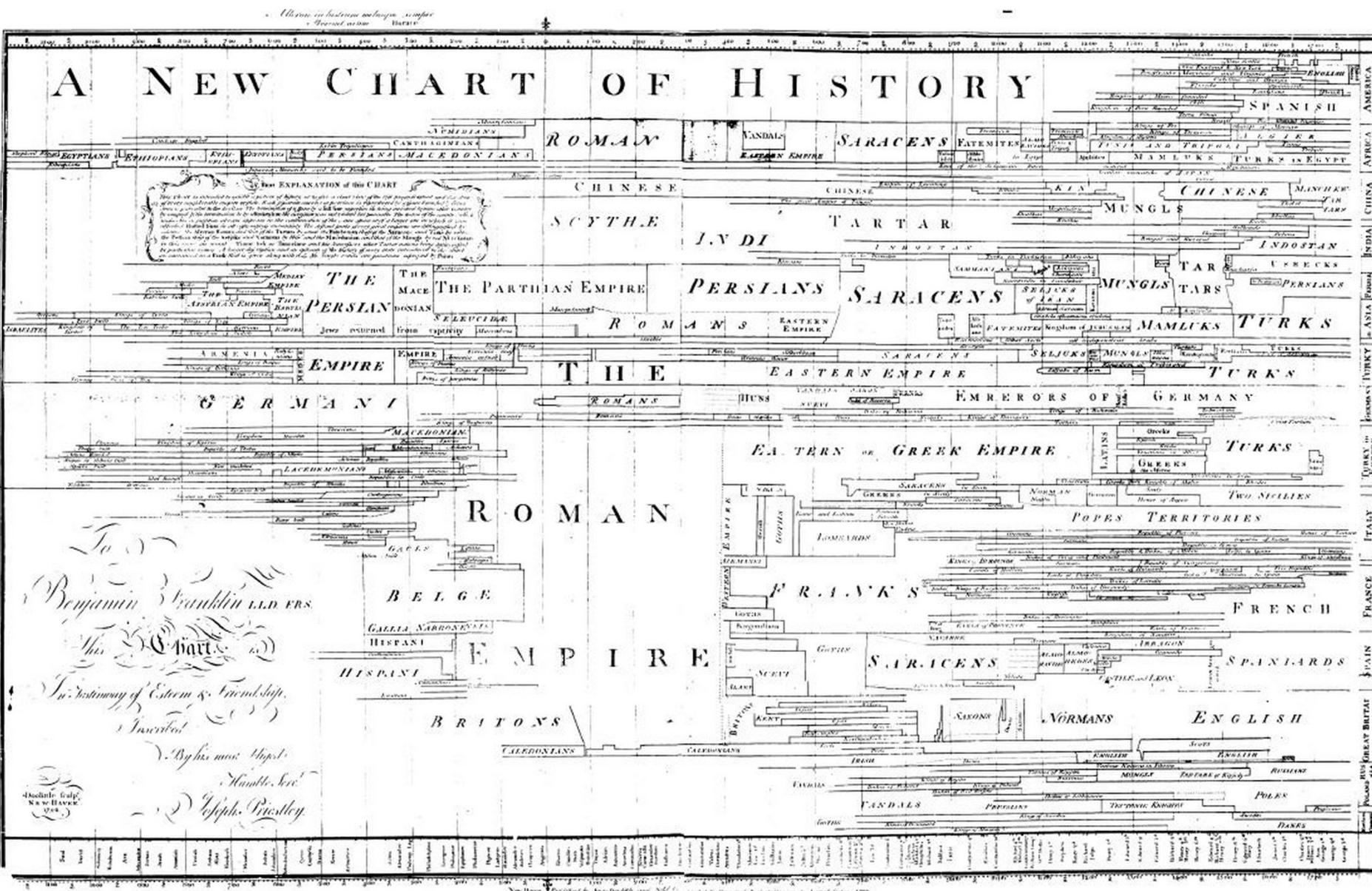


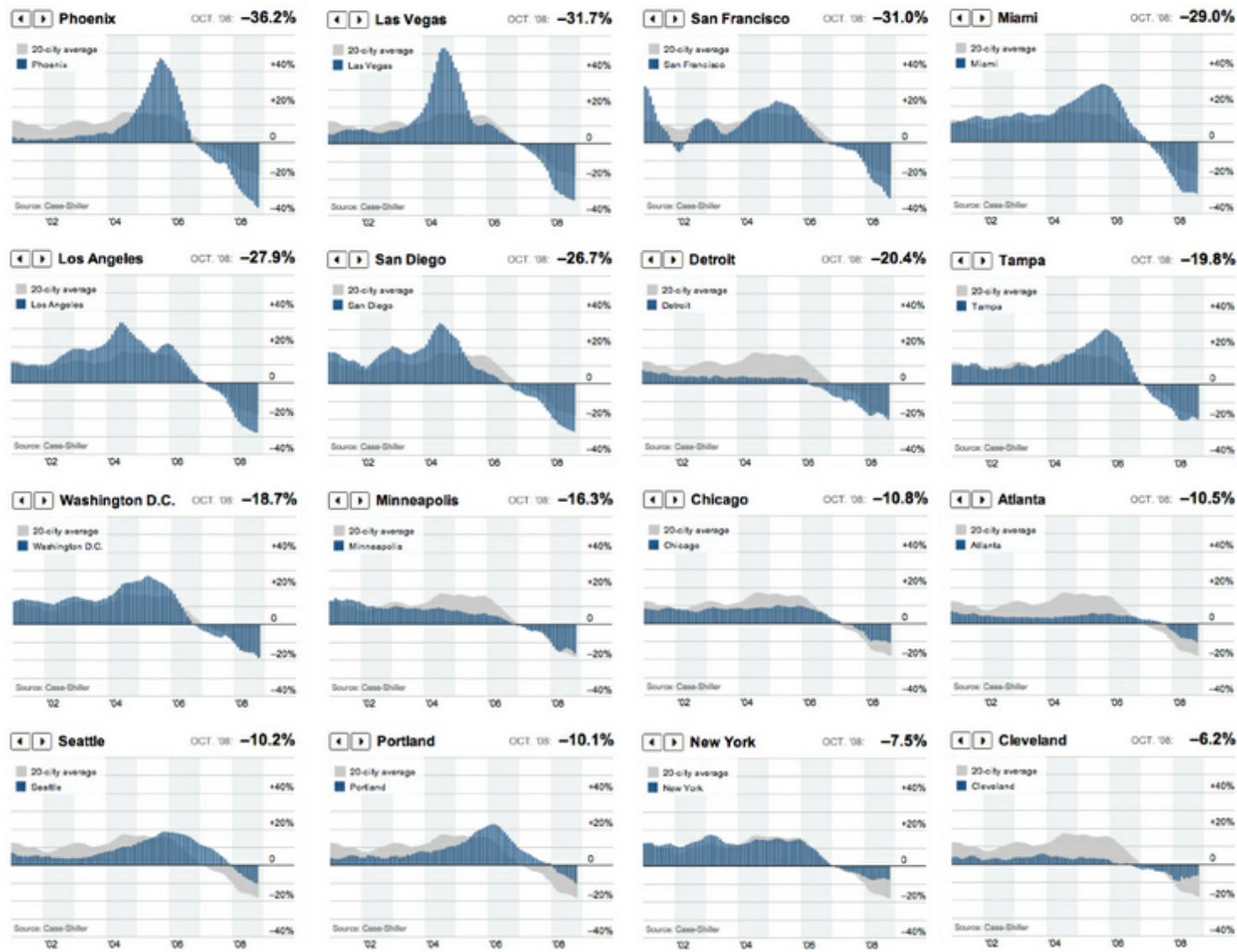
Chart source: Havre et al., 2000. *ThemeRiver: Visualizing theme changes over time.*

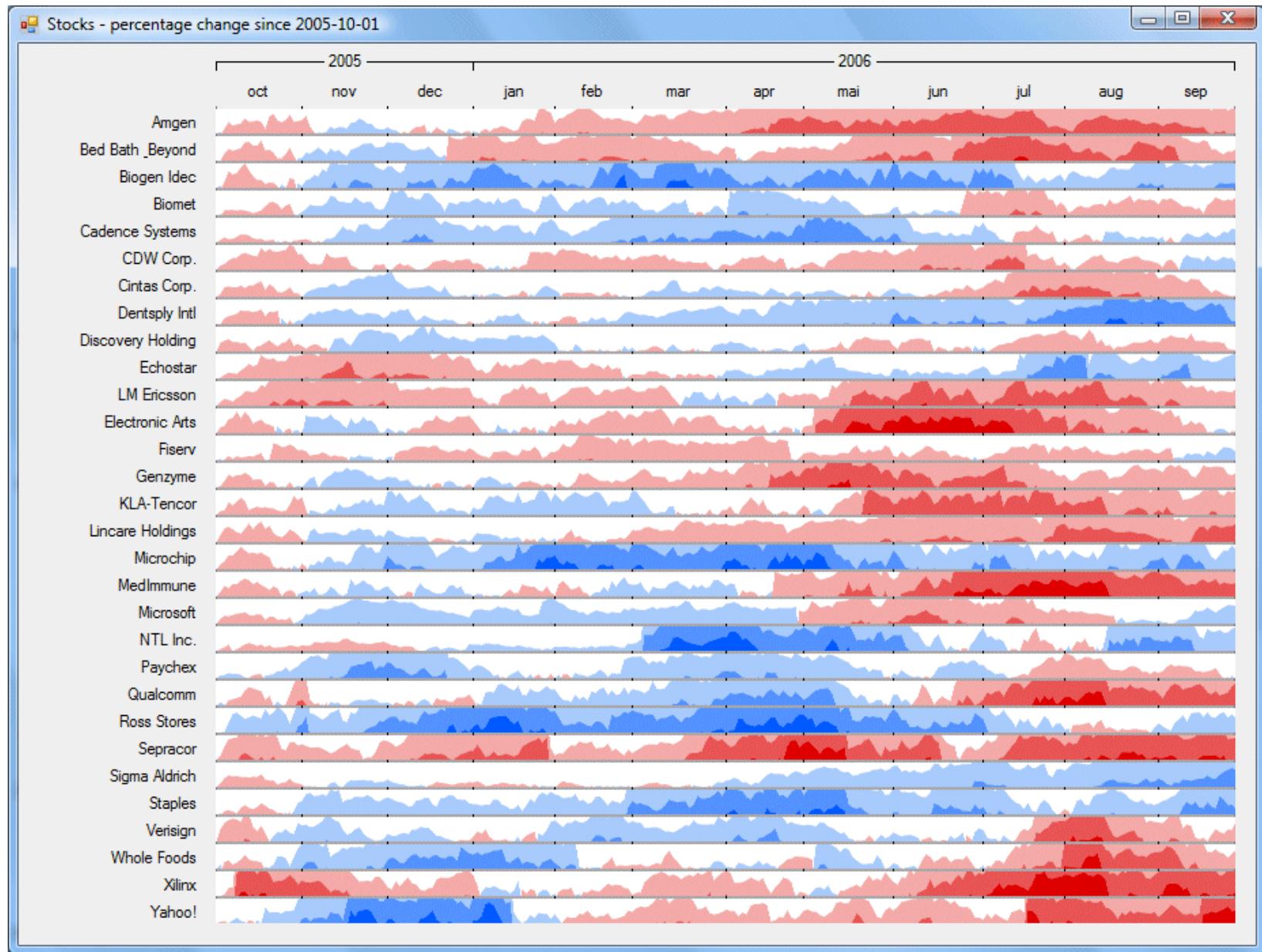


Joseph Priestly

Change in Home Prices (year over year)

From New York Times Economix blog



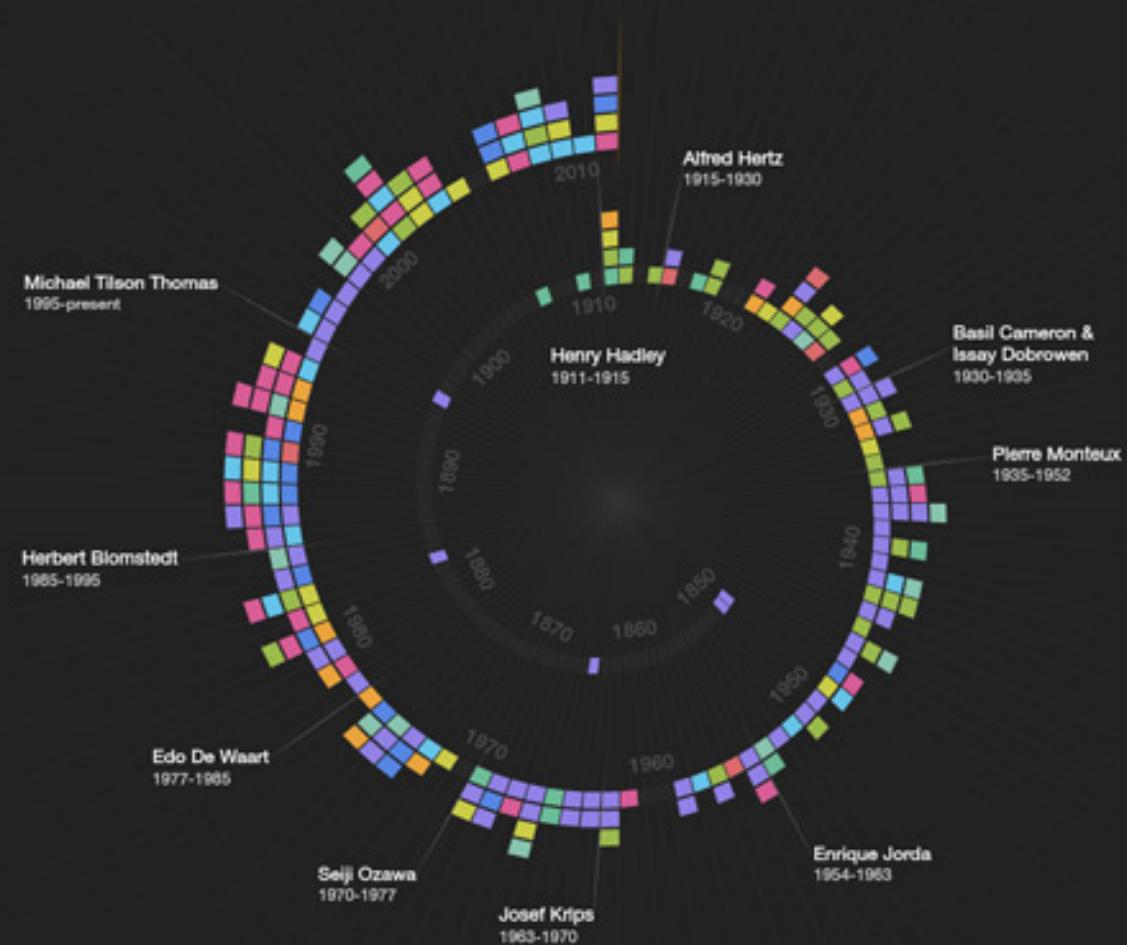


Cyclical

100 Years with the San Francisco Symphony

To get started, mouse over the spiral - each block represents a moment in SFS history. Click the categories below to watch a video and filter the timeline.

- Builders & Leaders
- For The People
- Education
- A Place For Music
- Pioneer & Innovator
- New Music
- Music Makers
- On The Road
- Recordings
- Audio Tour



credits

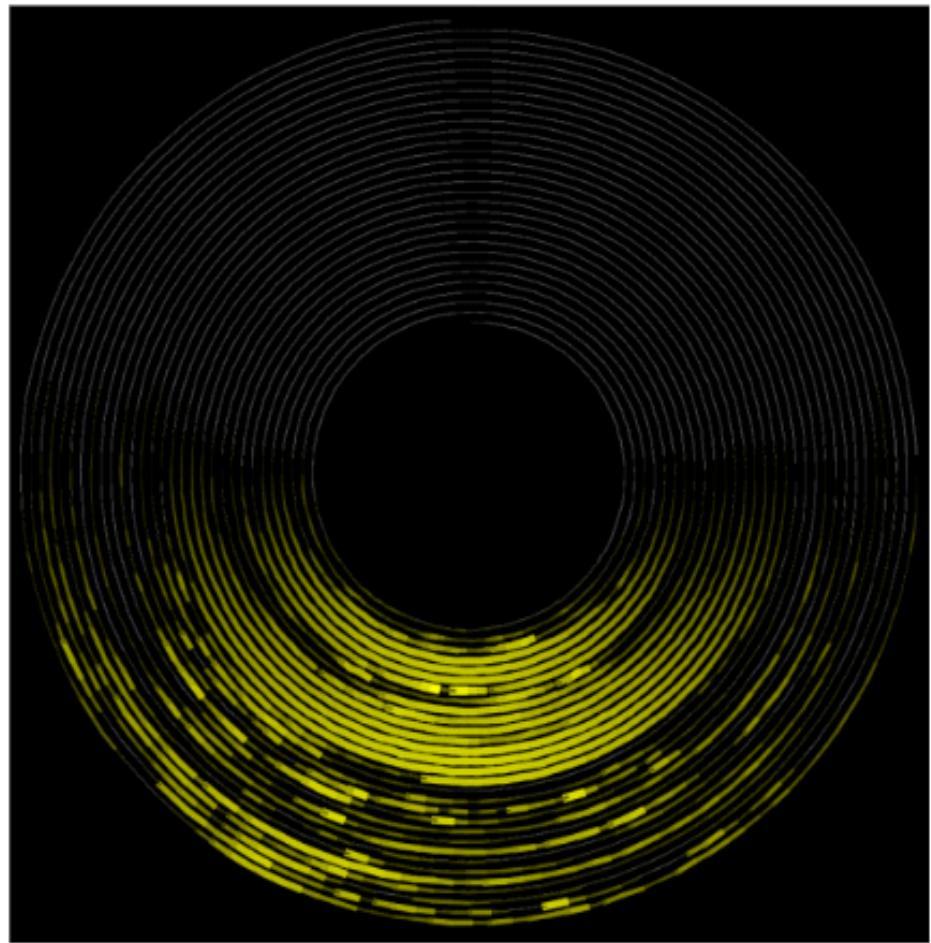
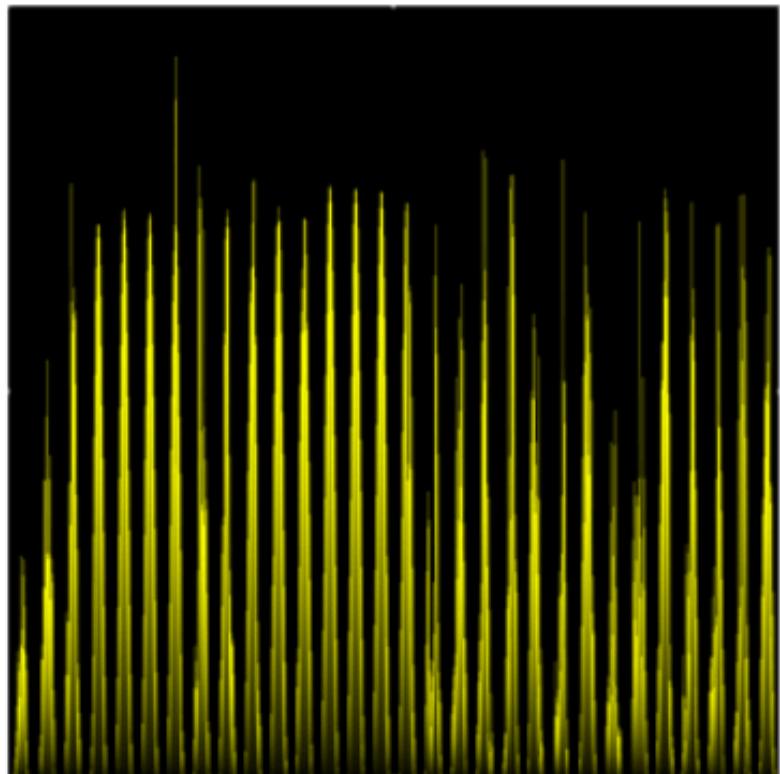


Diagram source: Weber, M., Alexa, M., & Müller, W. (2001, October). Visualizing time-series on spirals. In *Infovis* (Vol. 1, pp. 7-14).

Events

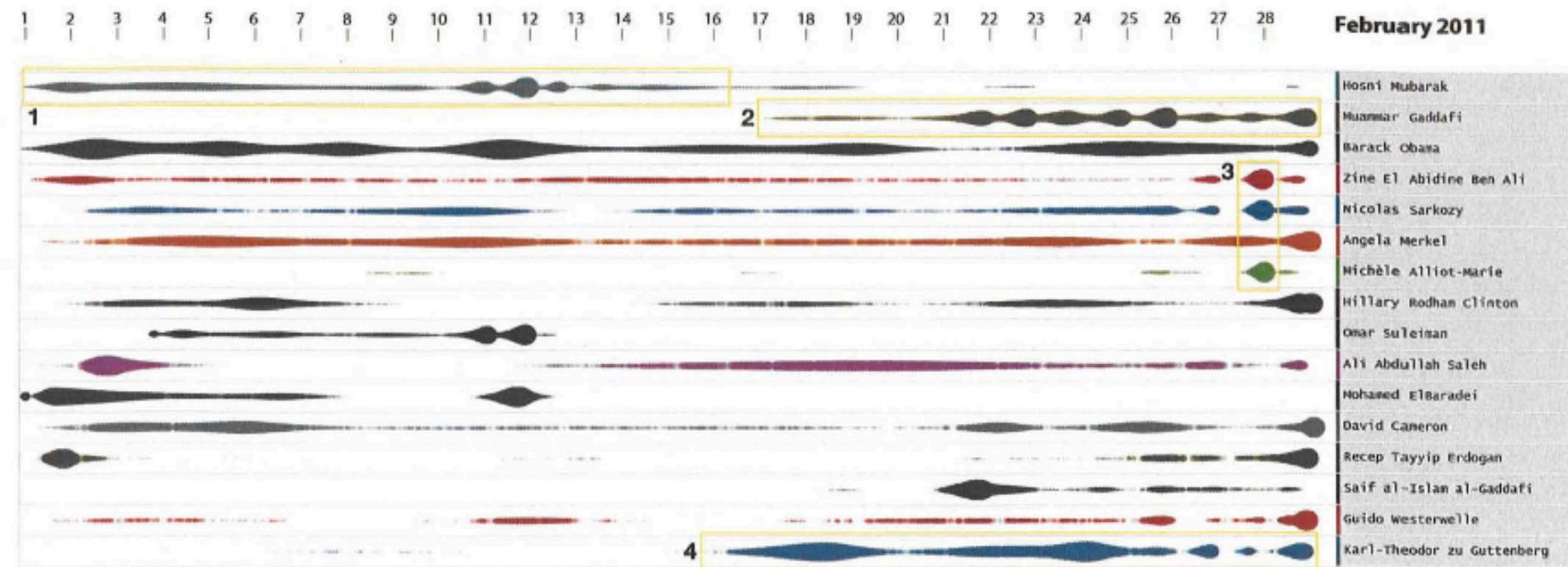


Chart source: Krstajic et al., 2011. *CloudLines: Compact display of event episodes in multiple time series.*



Chart source: Krstajic et al., 2011. *CloudLines: Compact display of event episodes in multiple time series.*

Time Analytic Algorithms

Clustering

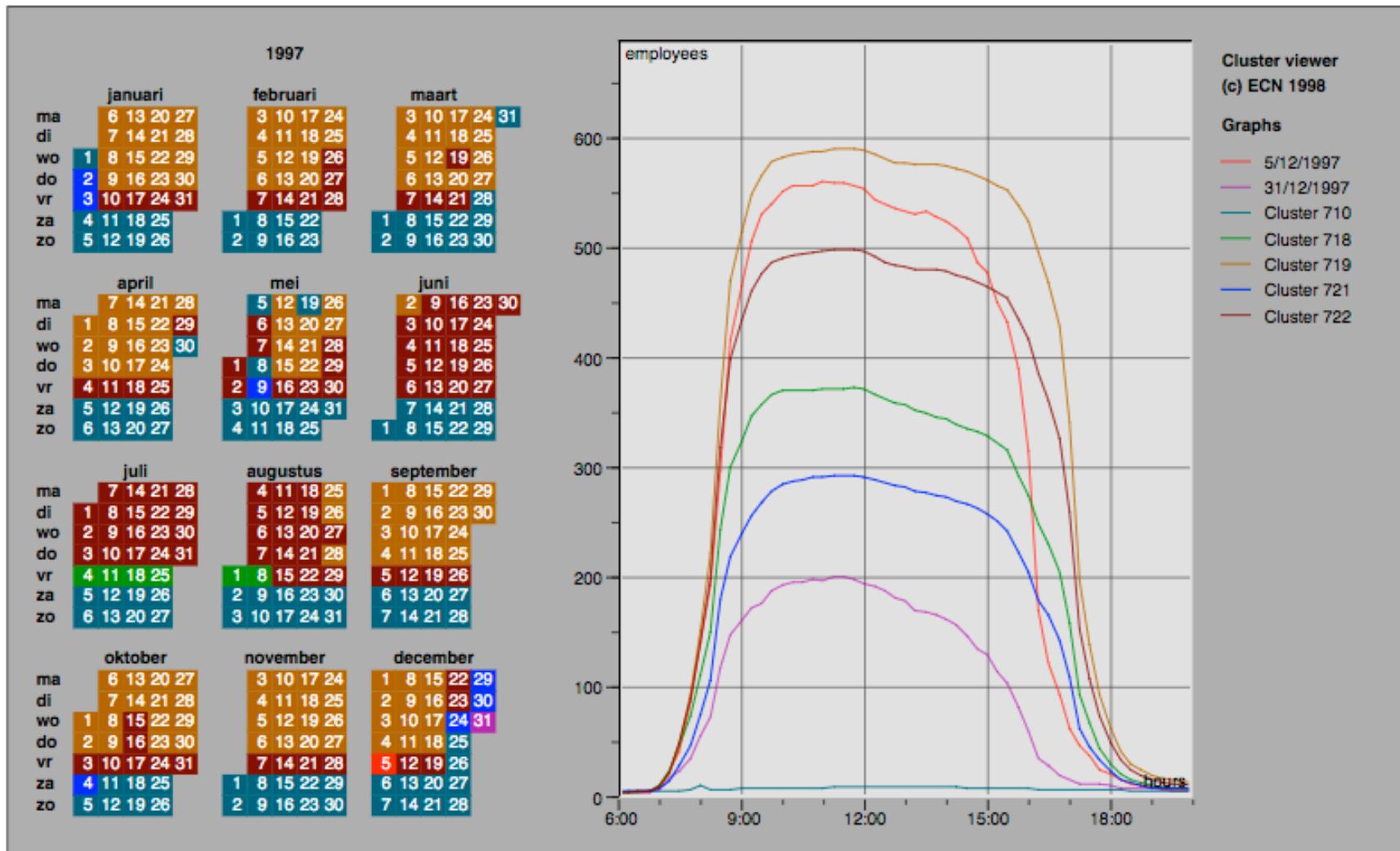


Figure 4. Calendar view of the number of employees

Van Wijk & Selow, 1999

Clustering

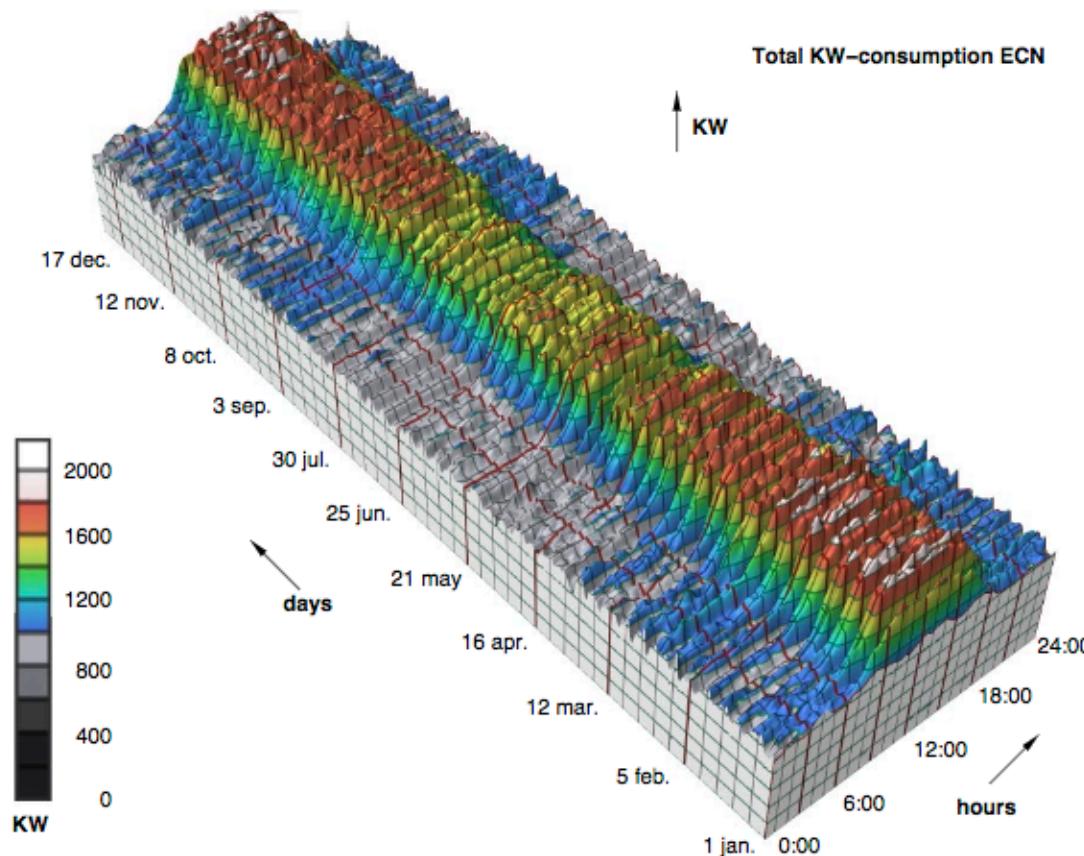
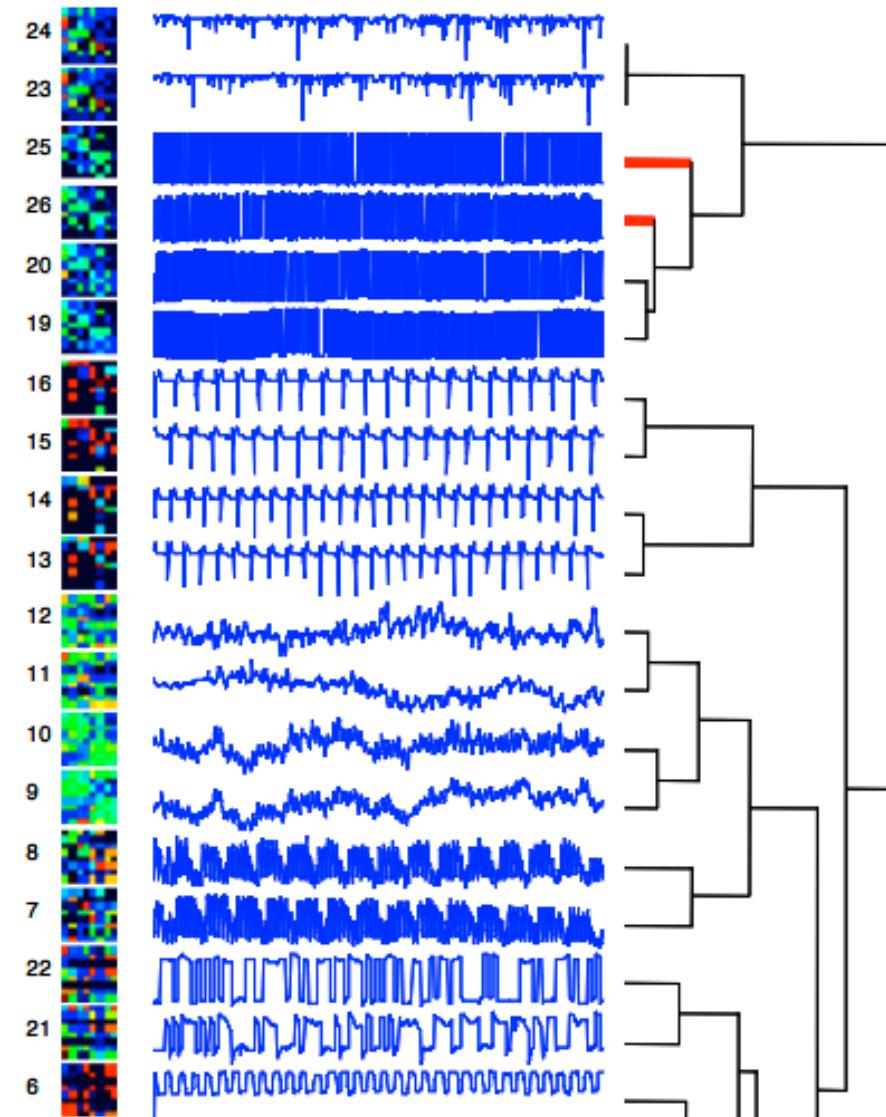
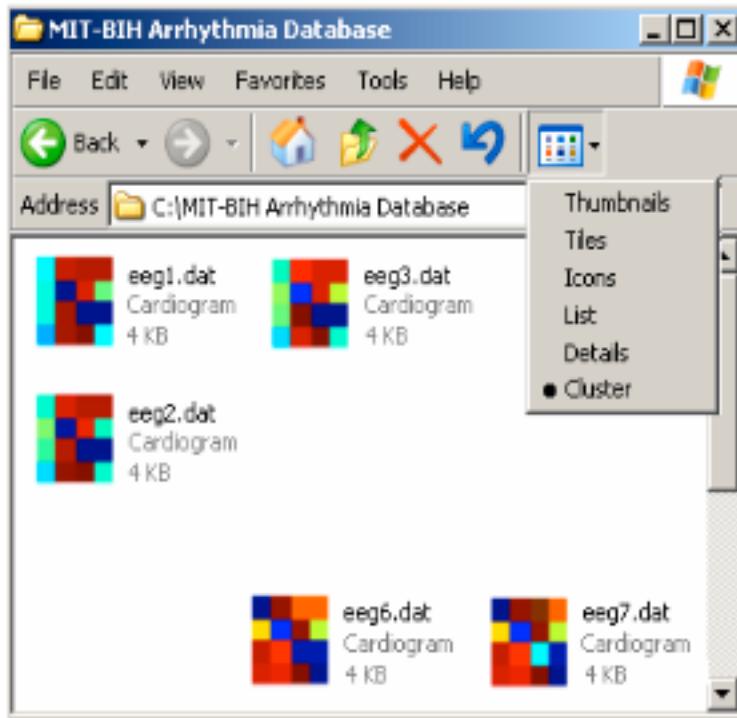
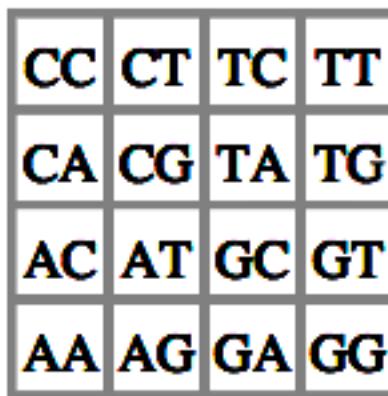
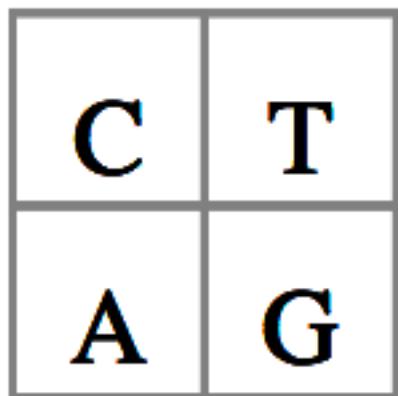


Figure 1. Power demand by ECN, displayed as a function of hours and days

Time Series Bitmaps



Kumar et al., 2005

Berkeley

SCHOOL OF
INFORMATION