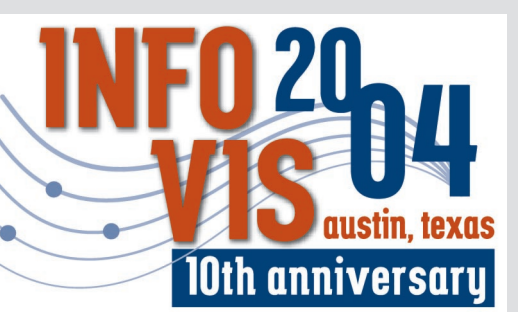




BinX: Dynamic Exploration of Time Series Datasets Across Aggregation Levels

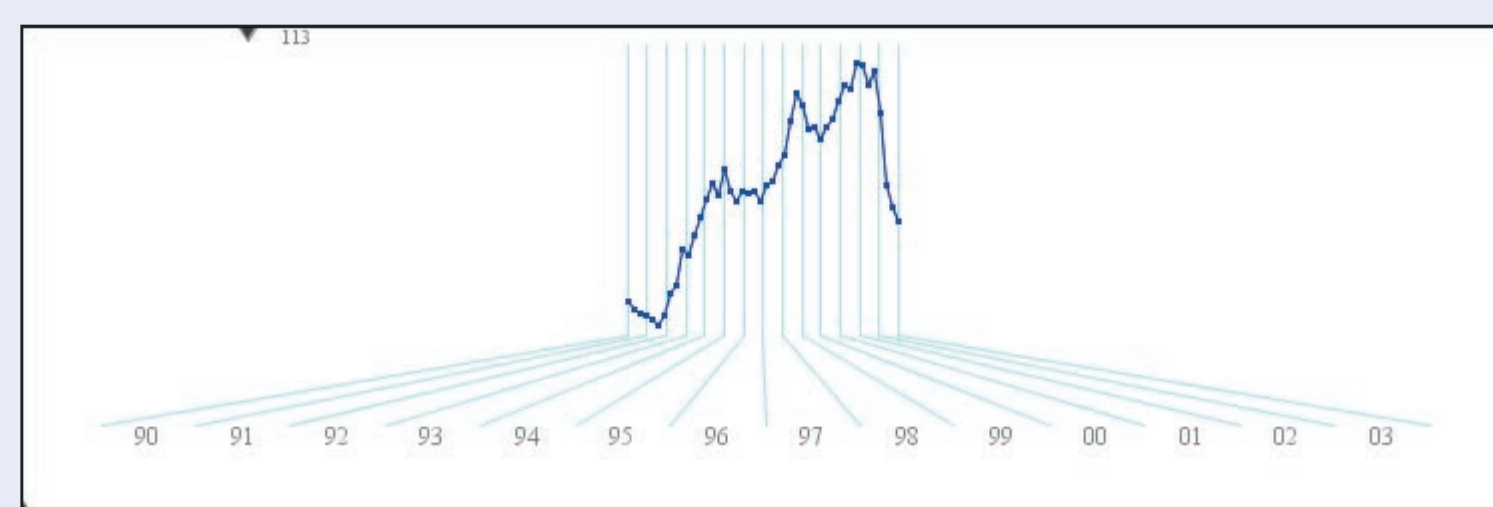
Lior Berry, Tamara Munzner



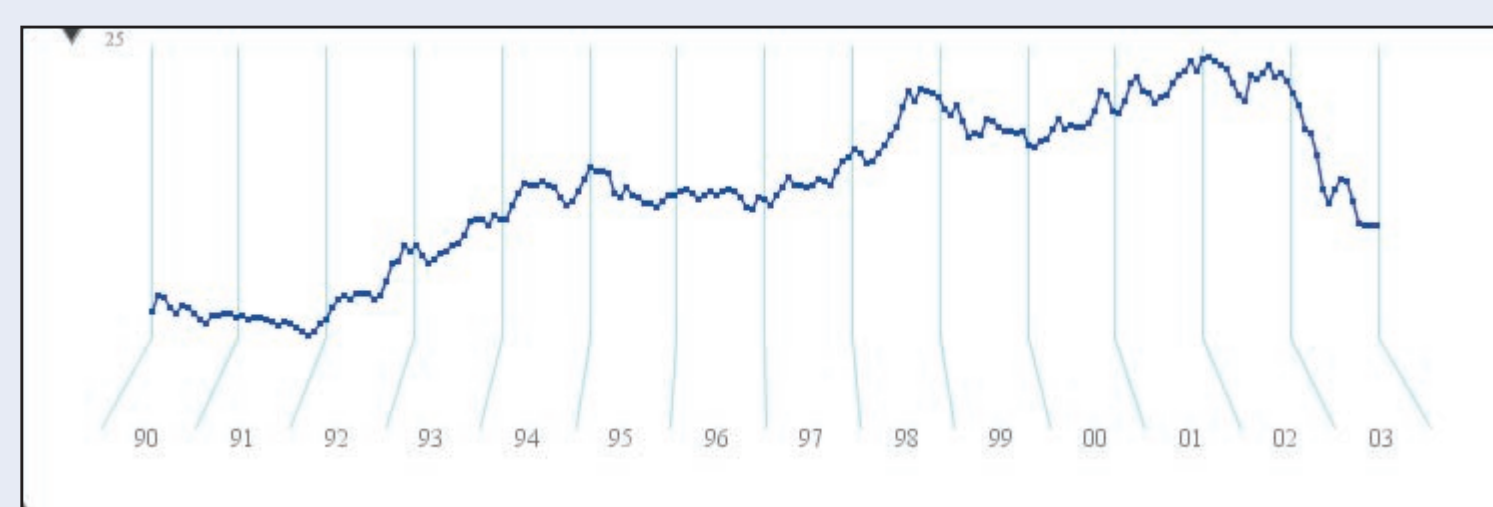
Aggregation with "Trapeze" Binning

- Timeseries data aggregated into bins
- Trapeze metaphor is used for both control and visual feedback
- Slider controls aggregation level, dynamically changing the number of bins used

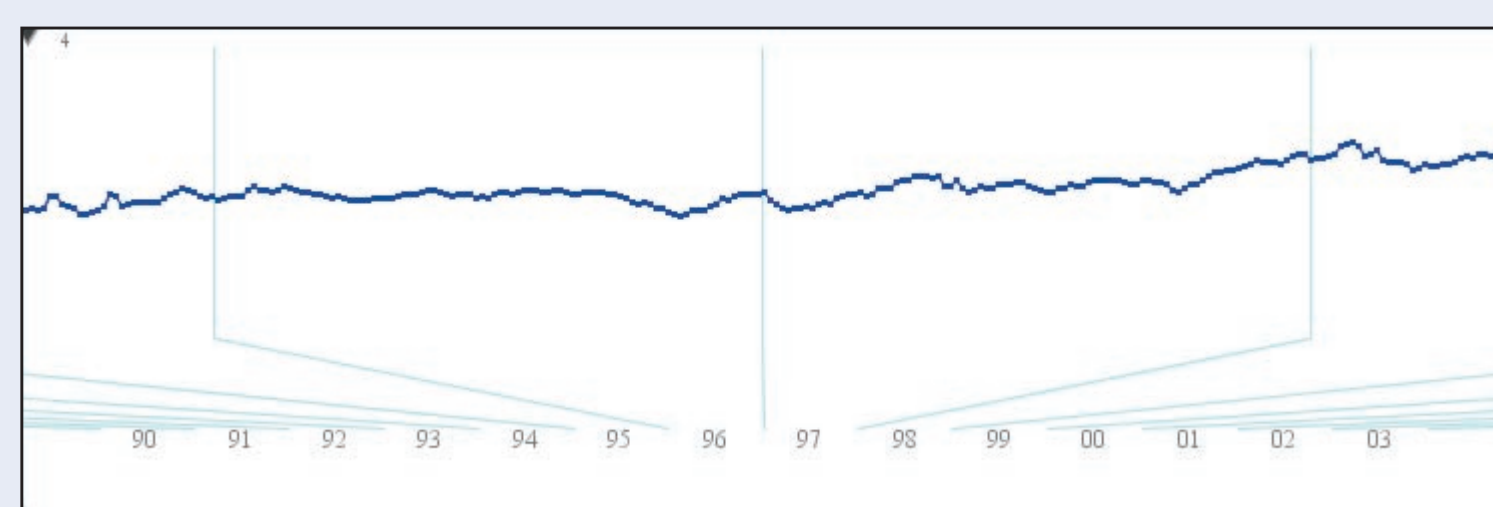
Trapeze Zooming



High aggregation: Zoomed out
Trapeze top is narrowed with inward slanting lines

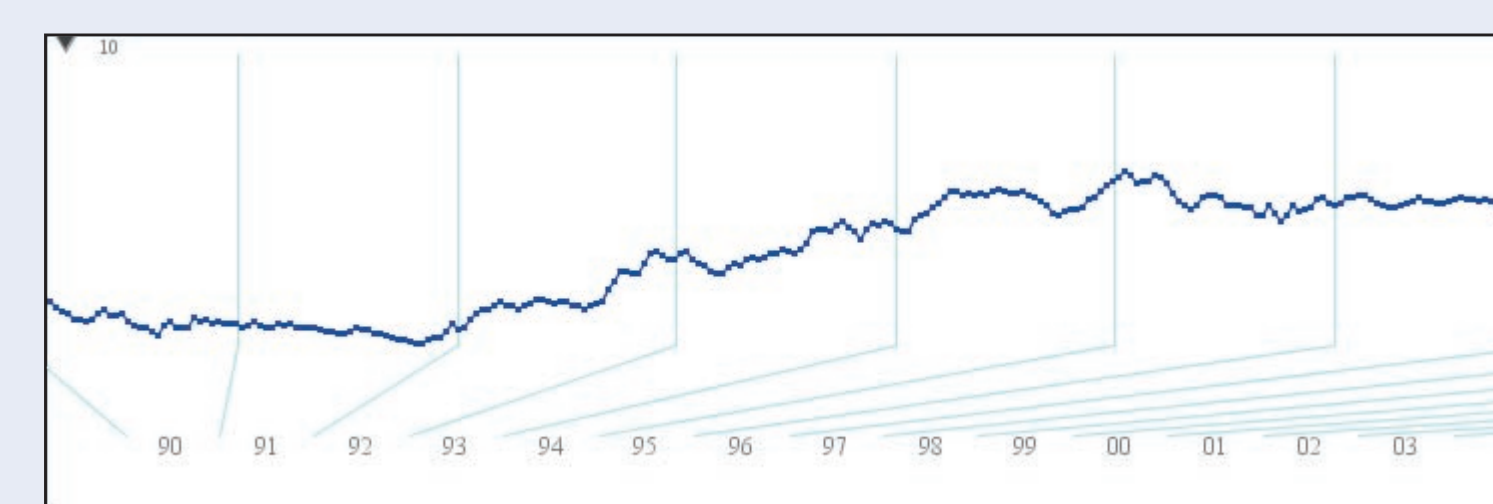


Intermediate aggregation:
Smooth transition between aggregation levels



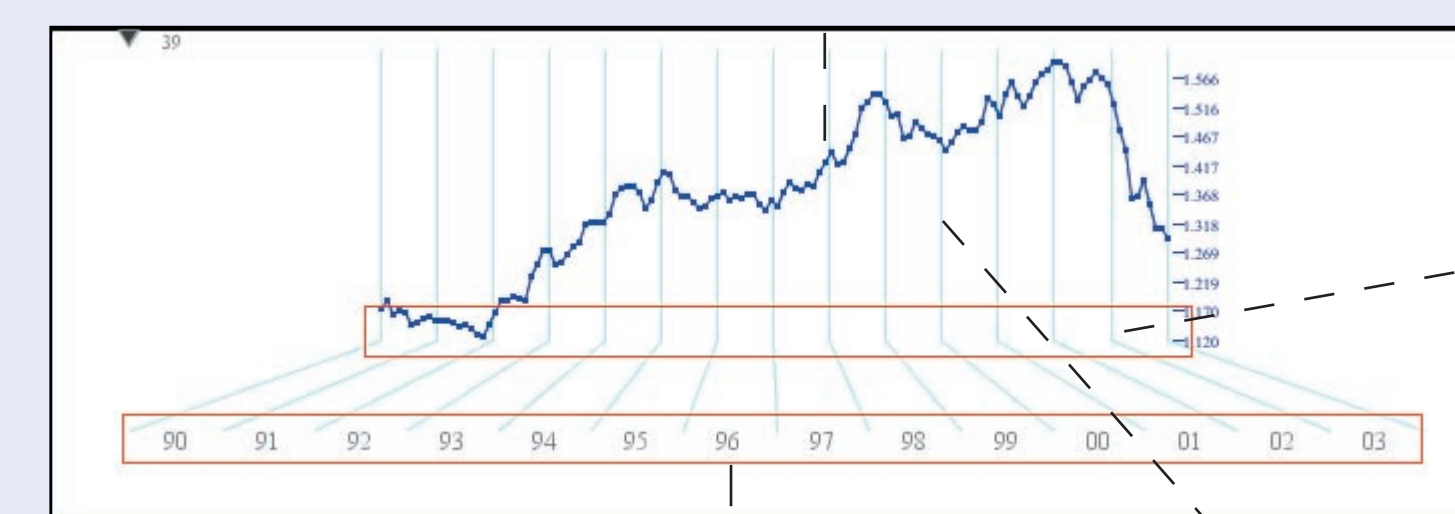
Low aggregation: Zoomed in
Trapeze top is expanded. outward slanting lines indicate the existence of off-screen data

Trapeze Panning



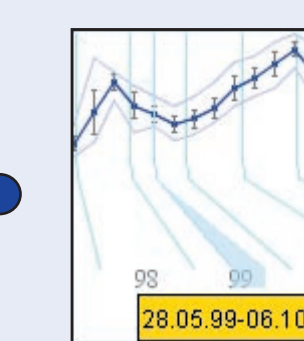
- Time coordinate axis is anchored
- Navigate by horizontally shifting time series plot to bring desired time to focus
- *Trapeze is skewed*

Line Graph at a controllable aggregation level



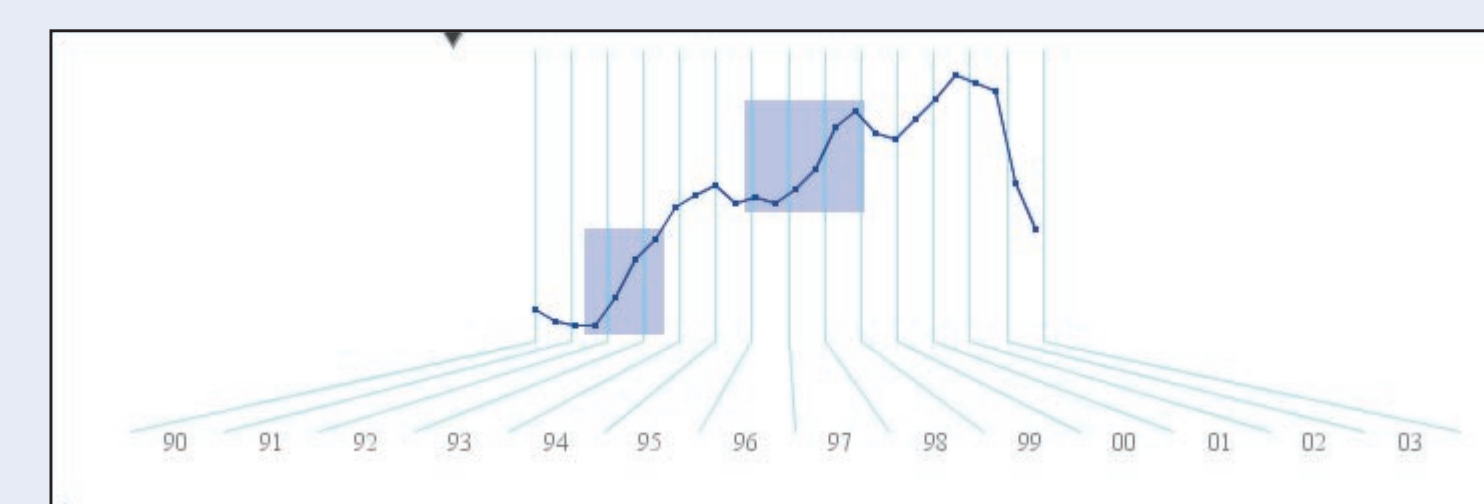
Vertical and slanted timelines are tick marks demarcating time intervals on the binned data

Fixed time coordinate axis shows full range of dataset

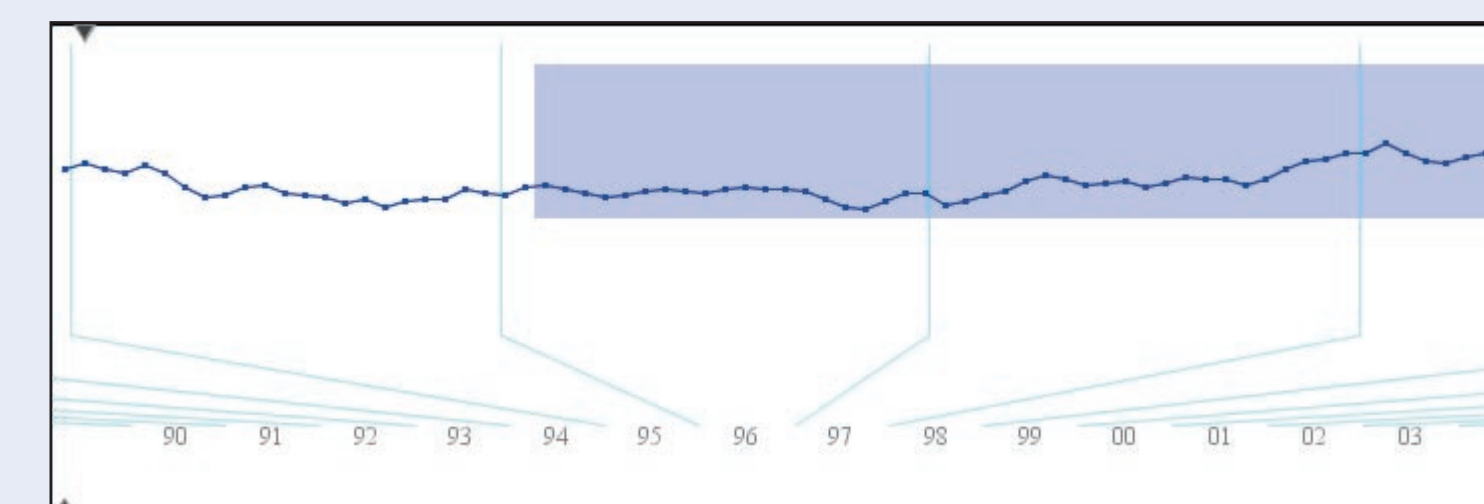


Optional Information on binned data

Marking time periods

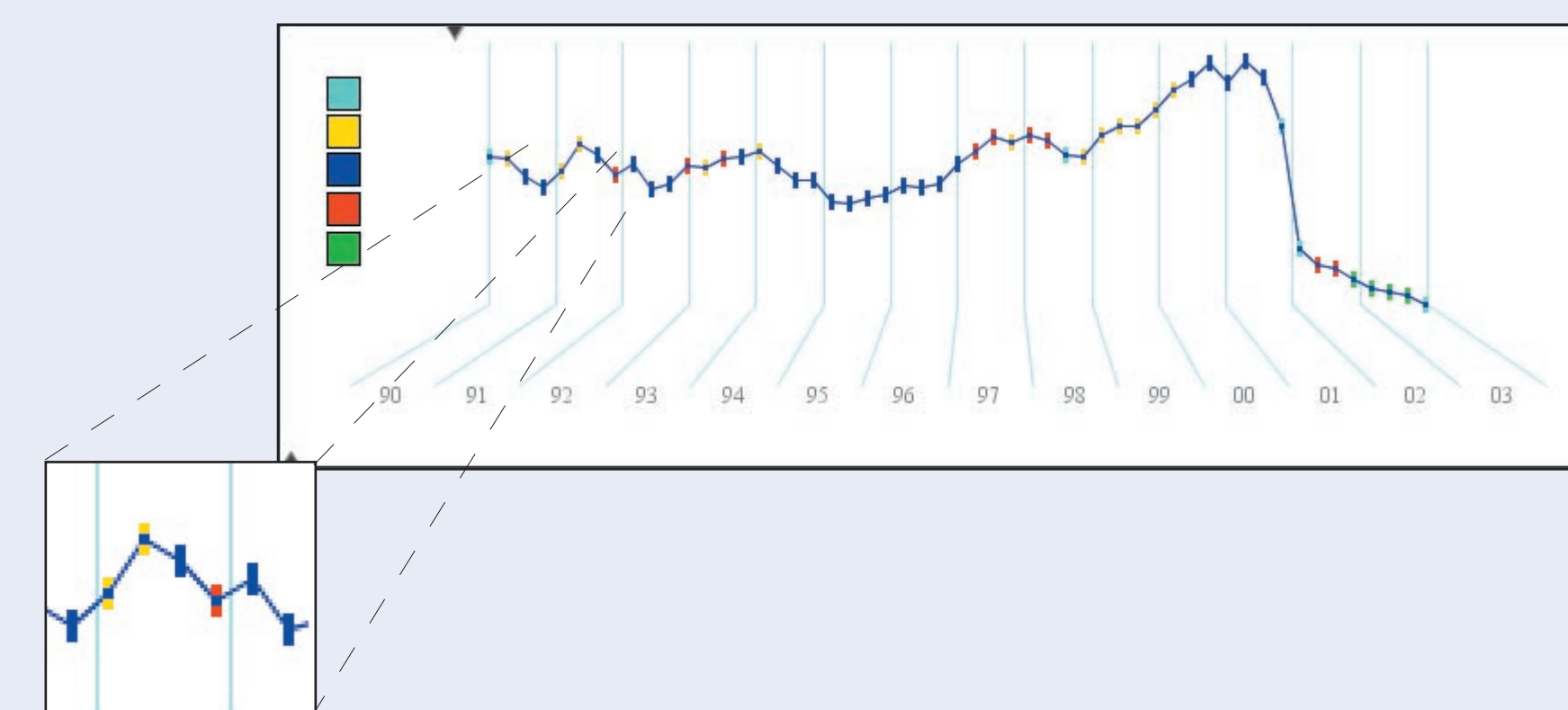


Easily select long ranges at high aggregation



Fine tune selection boundaries at low aggregation

Bin clustering



- Classify bins into clusters
- Use viewed aggregation level
- Color coded bin classification integrated into view

DTVC

- **D**ynamic **T**ime series **V**isualization **C**omponent
- modular pluggable software component
- Self-contained UI
- Code available for free download:
<http://www.cs.ubc.ca/~berry/projects.htm>

Example application: Currency exchange rate analysis tool



- 5000 samples (daily rate over 15 years)
- Using two DTVC components
- Linked or separate navigation and marking
- Detail + Overview: two distinct aggregation levels

Scatter Plot View

Time independent correlation between currencies
(linked to active DTVC)

