Interaction

Week 10 CPSC 533C, Spring 2004

11 Feb 2004

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- Ware: Interaction
- Cognitive Co-Processor
- SDM
- Dynamic Queries
- Toolglass/Magic Lenses
- more interaction
  - Influence Explorer
  - LifeLines
  - Hierarchical Clustering Explorer
  - Exploratory Data Views
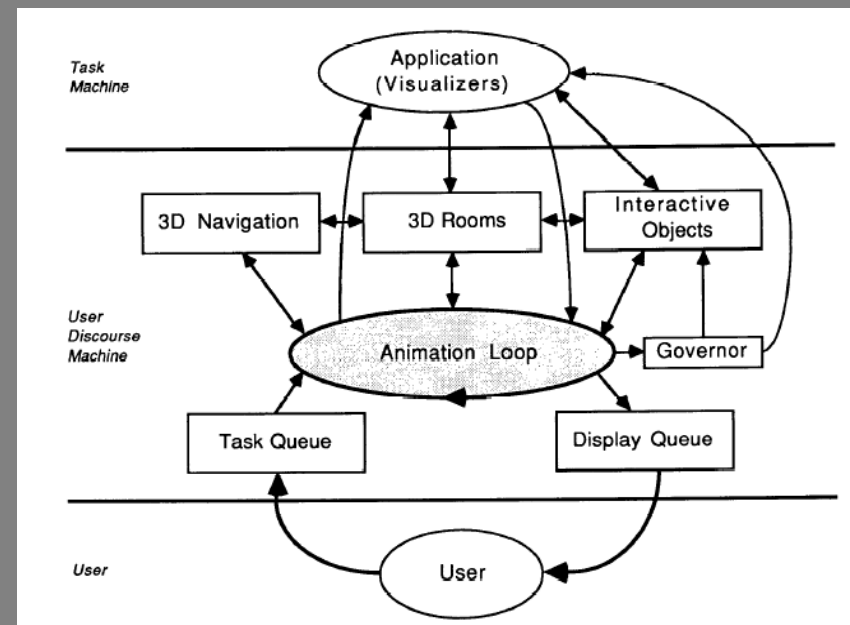- ThemeScapes video (if time)

Ware Interaction

- control loops
  - Fitts' Law
    - time to select depends on distance, target size
- learning
  - power law of practice
- vigilance
  - difficult, erodes with fatigue
- navigation
  - next time

Ware Interaction

- rapid interaction
  - dynamic queries
  - brushing (linked highlighting)
- problem solving loops
  - external representations
    - external memory vs internal (working, LT, ST)
    - memory extensions enable otherwise impossible tasks
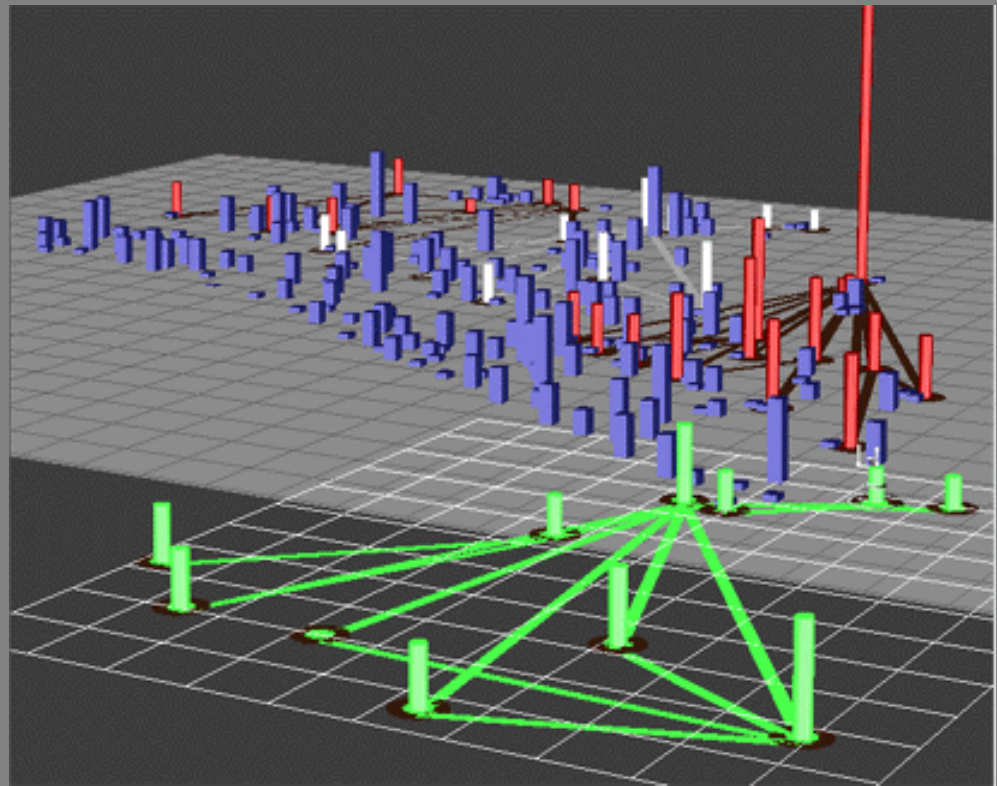   - visual spatial reasoning

Cognitive Co-Processor

- animated transitions
  - object constancy
  - fixed frame rate required
- architectural solution
  - split work into small chunks
  - animation vs. idle states
  - governor controls frame rate
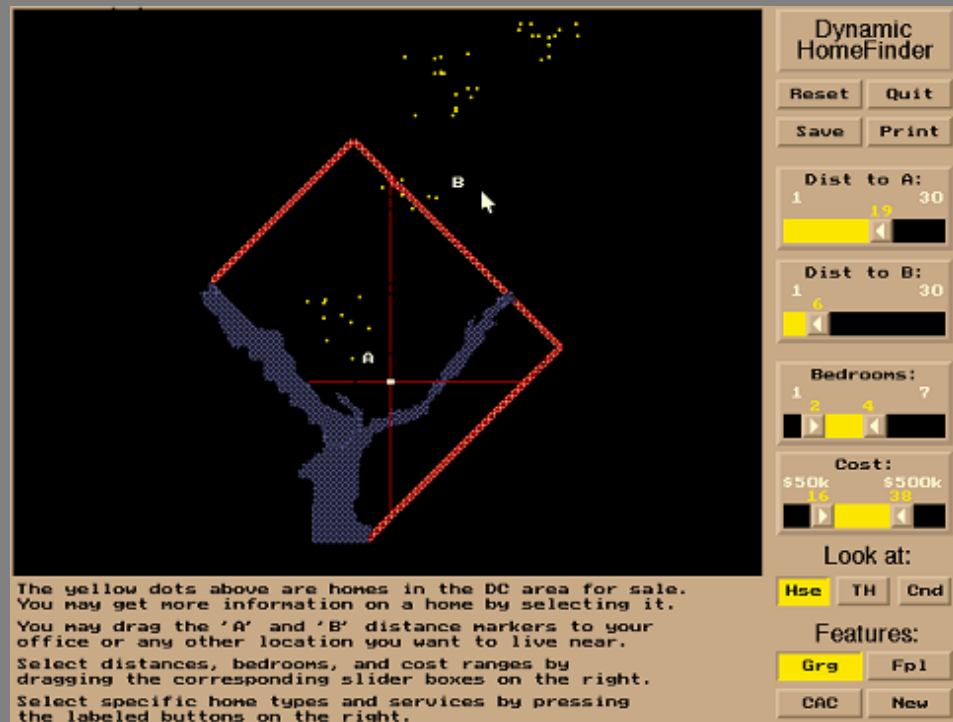
- [video: 3D rooms]

SDM

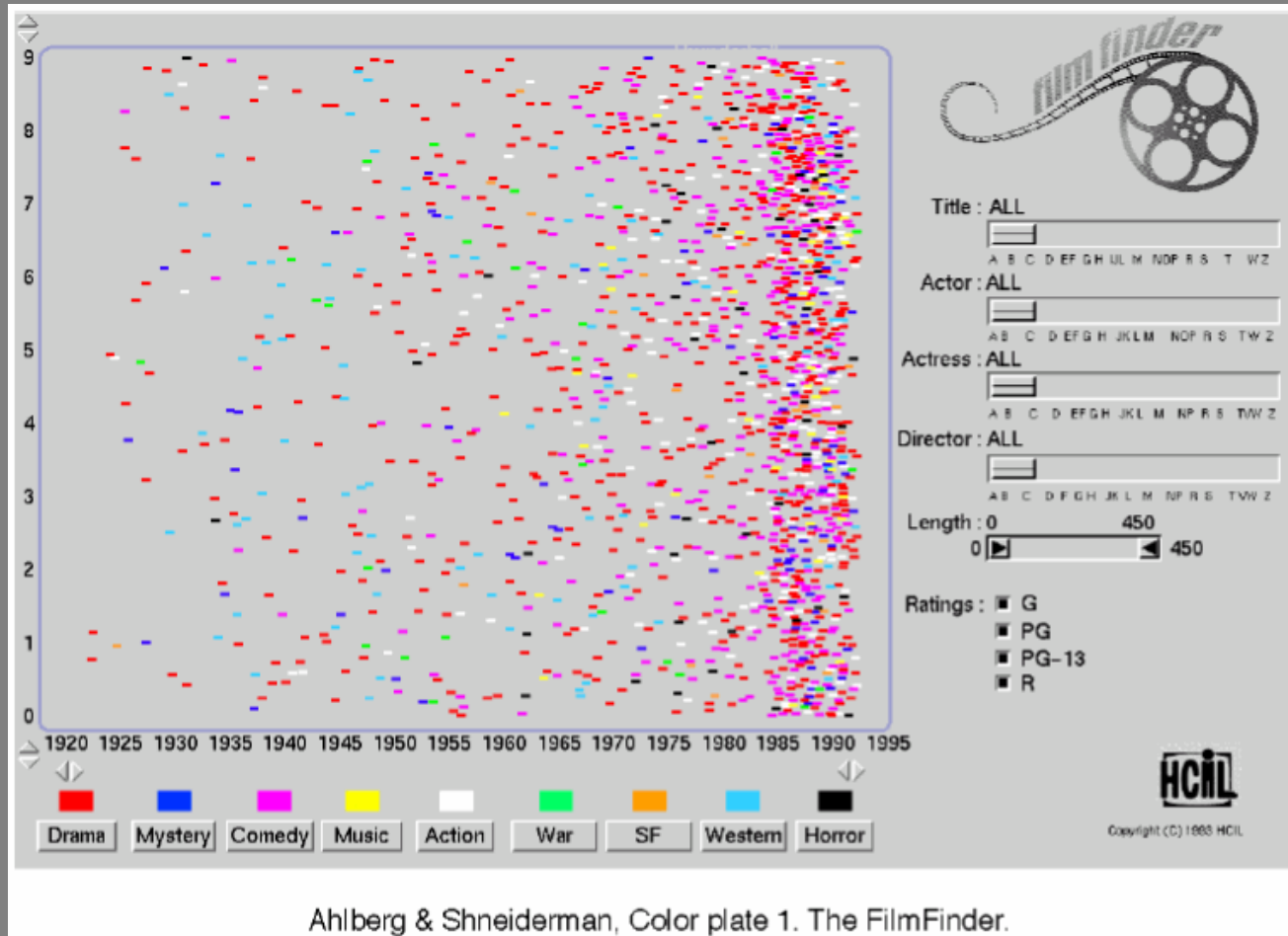- sophisticated selection, highlighting,
- object manipulation
- [video]

Dynamic Queries: HomeFinder

- filter with immediate visual feedback
- "starfield": scatterplot
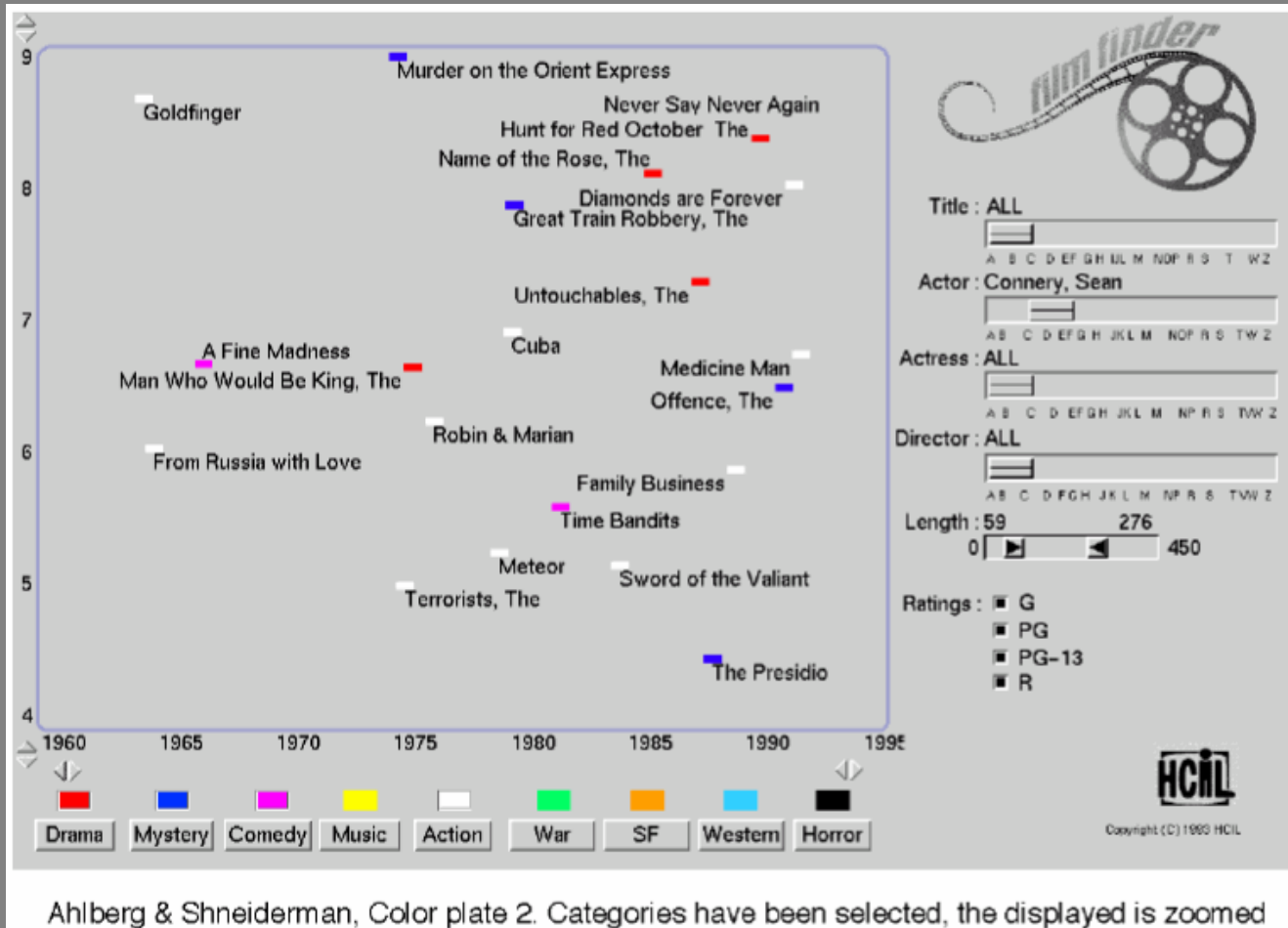- [video]

DQ 2: FilmFinder

Ahlberg & Shneiderman, Color plate 1. The FilmFinder.
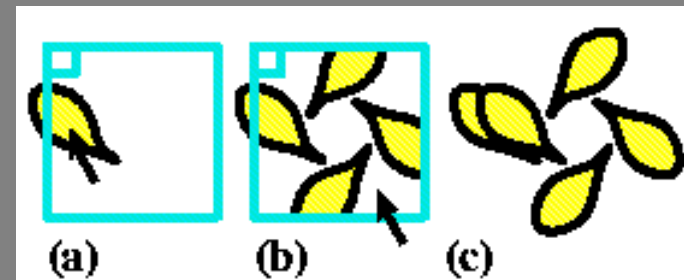
DQ 2: FilmFinder

Ahlberg & Shneiderman, Color plate 2. Categories have been selected, the displayed is zoomed
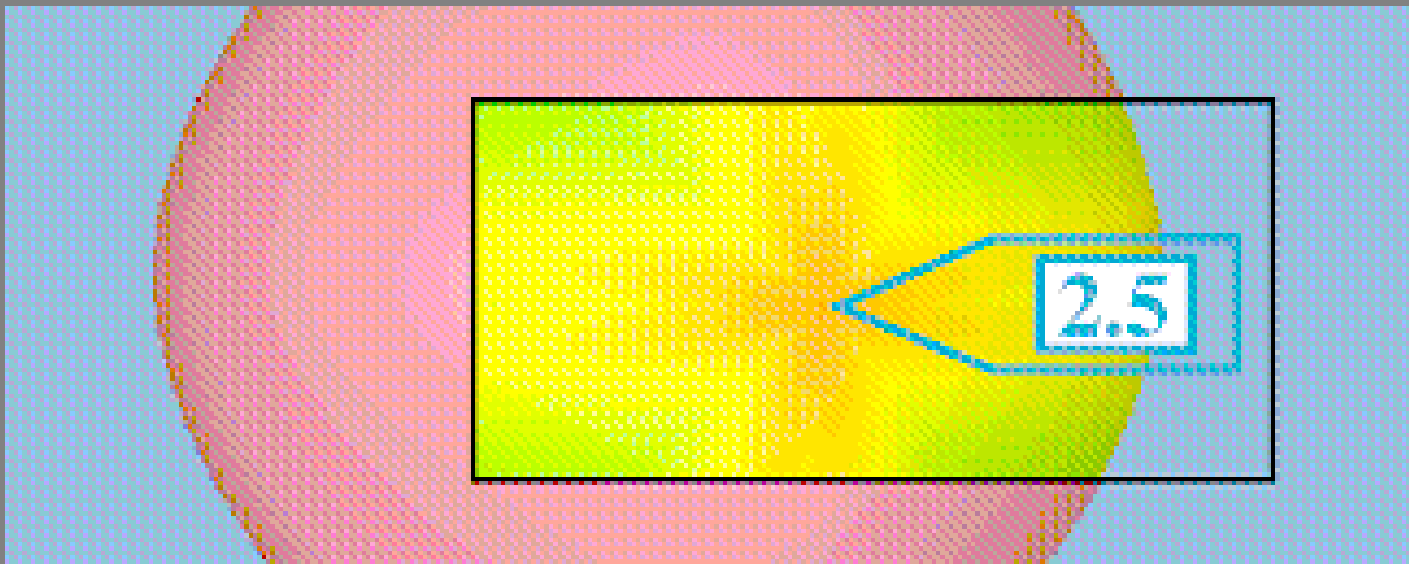
Toolglass/Magic Lens

- see-through
- two-handed

symmetry glass

curvature lens

More Linked Views

key infovis interaction principle

so far: Ware, trellis, xgobi, cluster calendar,
    parallel coords brushing, ...

new examples:
    Attribute Explorer
    LifeLines
    Hierarchical Clustering Explorer
    EDV

Influence/Attribute Explorer

- Visualization for Functional Design, Bob Spense, Lisa Tweedie, Huw Dawkes, Hua Su, InfoVis 95

[video]

LifeLines

- LifeLines: Visualizing Personal Histories. B. Milash, C. Plaisant, A. Rose (University of Maryland). CHI 96 Video Program
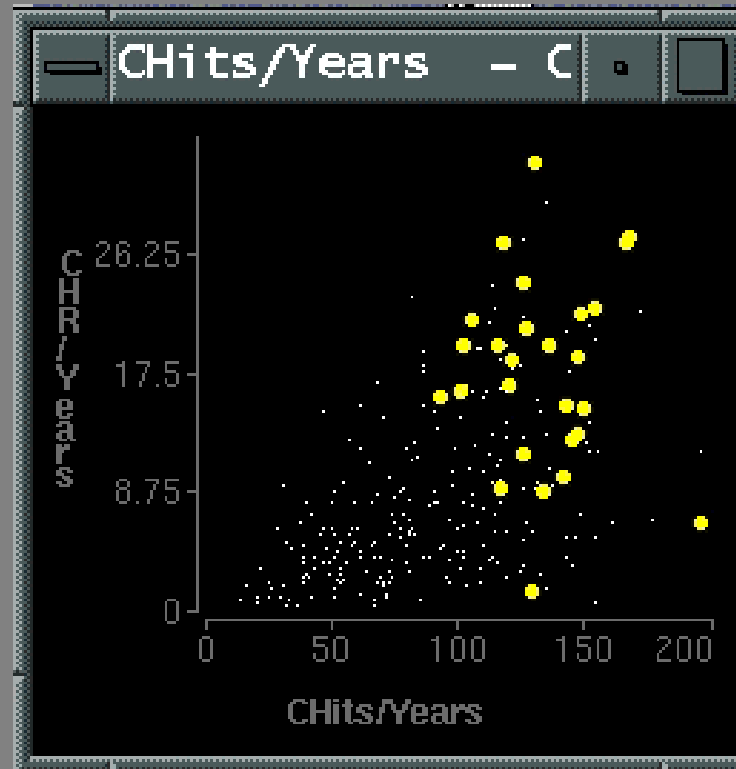
- [video]

EDV

Exploratory Data Visualizer

Graham J. Wills. Visual Exploration of Large Structured Datasets. In *New Techniques and Trends in Statistics*, 237-246. IOS Press, 1995.
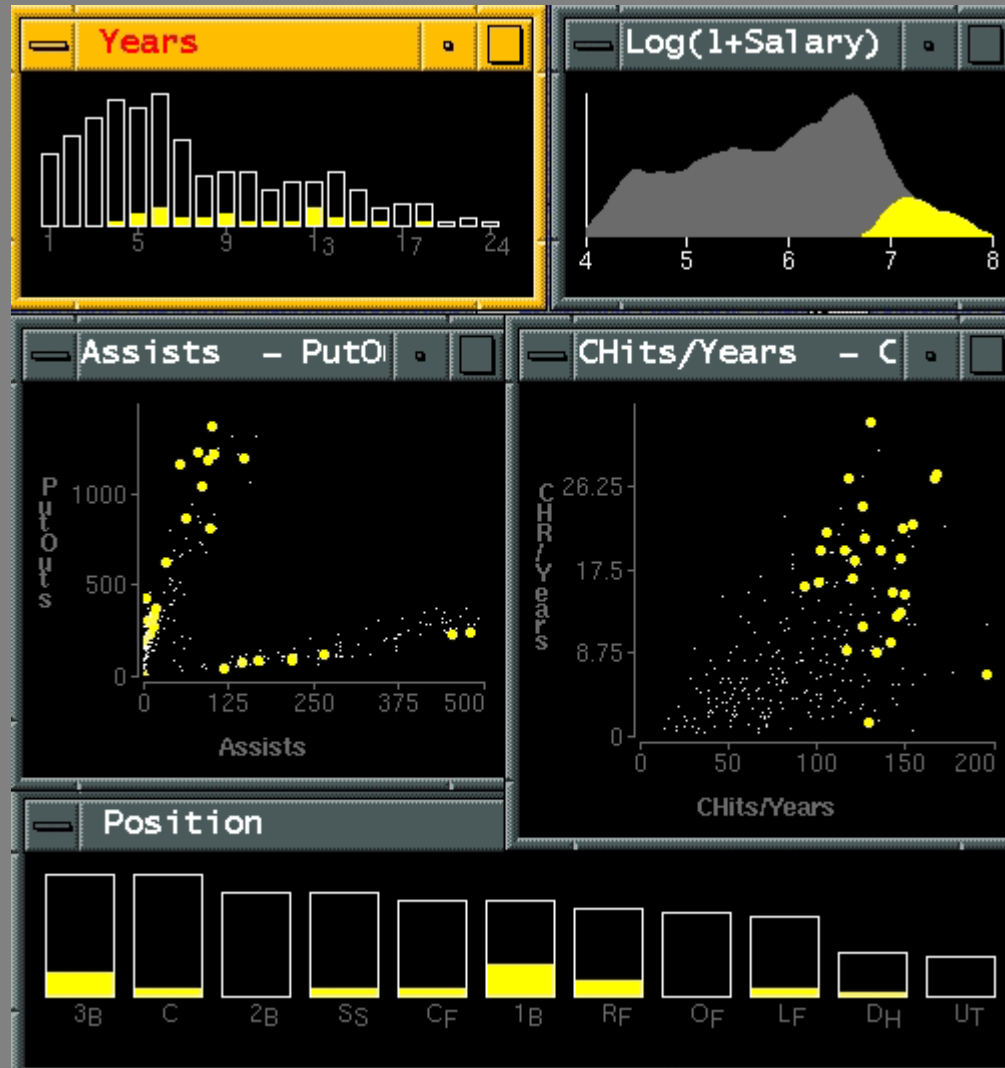
Highlighting (Focusing)

Focus user attention on a subset of the
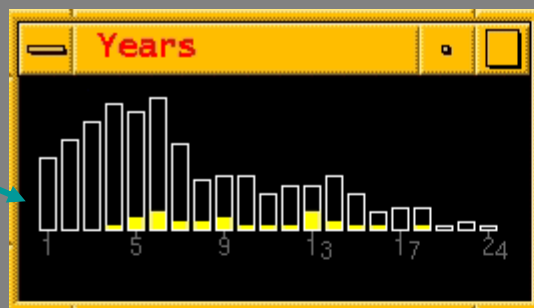data within one graph (from Wills 95)

Link different types of graphs:
Scatterplots and histograms and bars
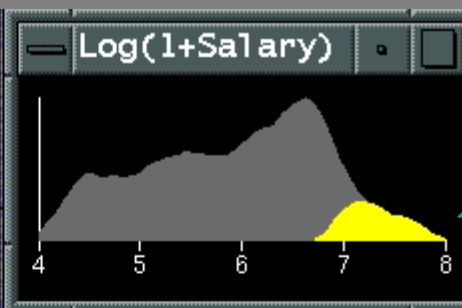### (from Wills 95)

Baseball data:
Scatterplots and histograms and bars
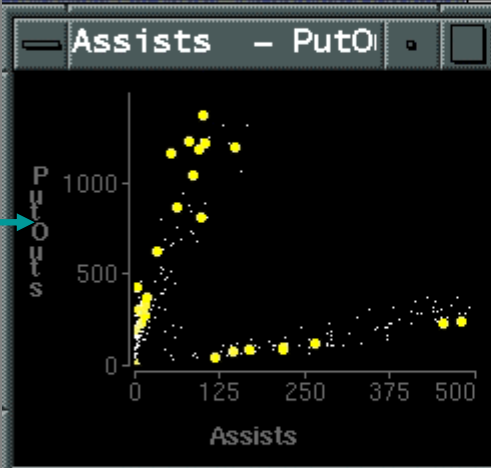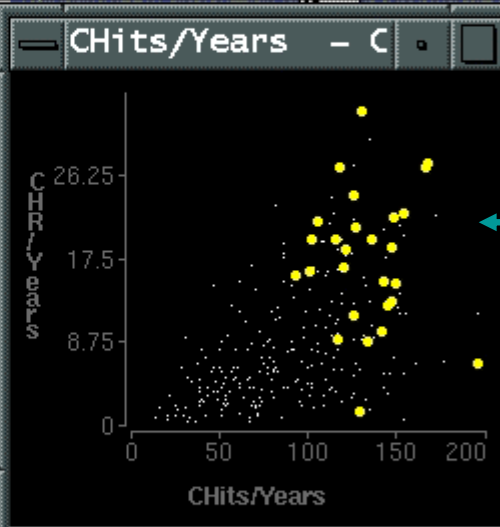## (from Wills 95)

how long
in majors

select high
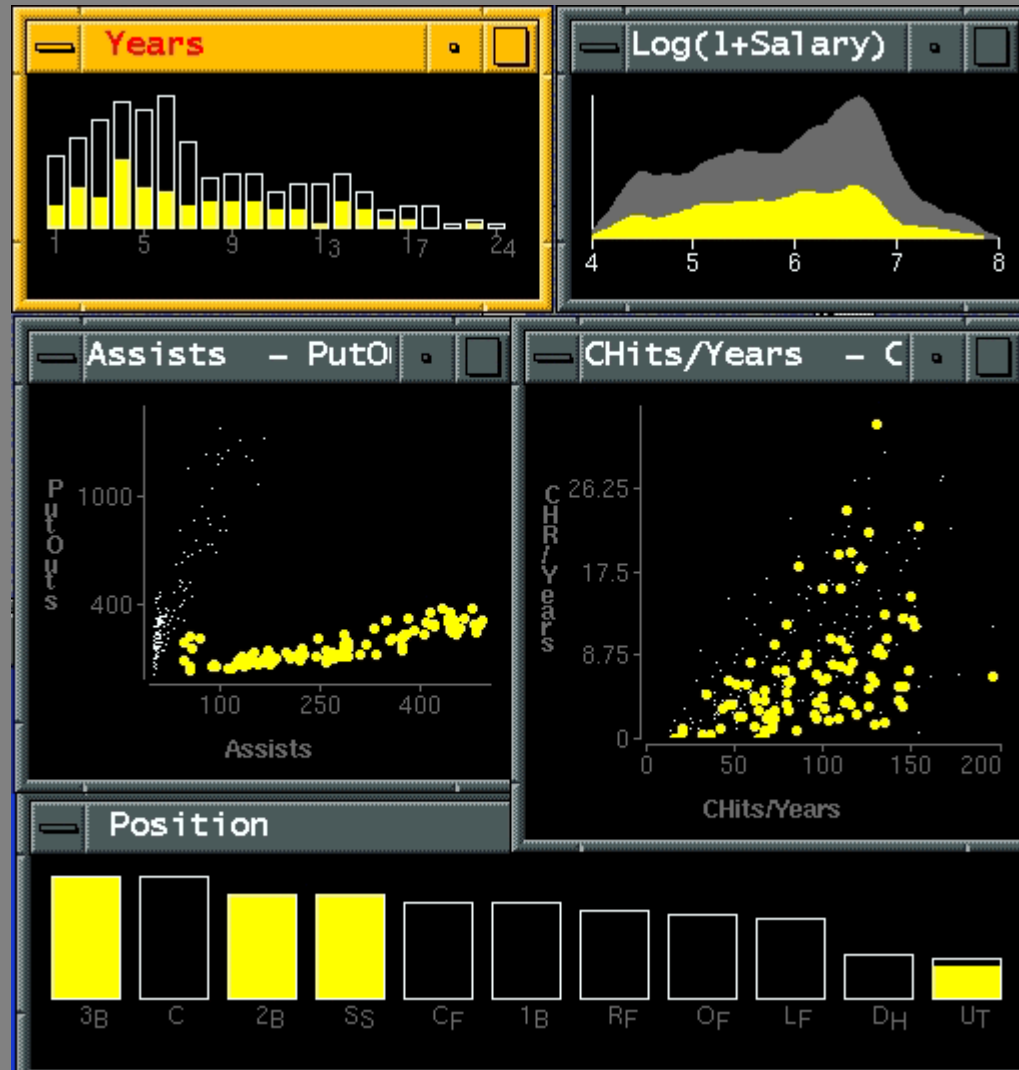salaries

avg assists vs
avg putouts
(fielding ability)

avg career
HRs vs avg
career hits
(batting ability)

distribution
of positions
played

Linking types of assist behavior to position played (from Wills 95)

HCE

Hierarchical Clustering Explorer

Jinwook Seo, Ben Shneiderman, "Interactively Exploring Hierarchical Clustering Results," IEEE Computer, Volume 35, Number 7, pp. 80-86, July 2002.

HCE

- Linked views
- Dendrogram navigation
- Comparing multiple dendrograms

[demo]

False negatives vs. positives