Tree Maps

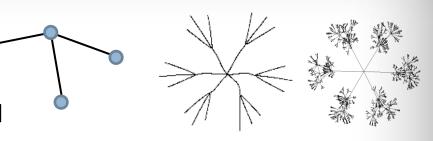**John C. Hart**

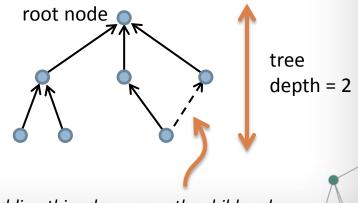Department of Computer Science
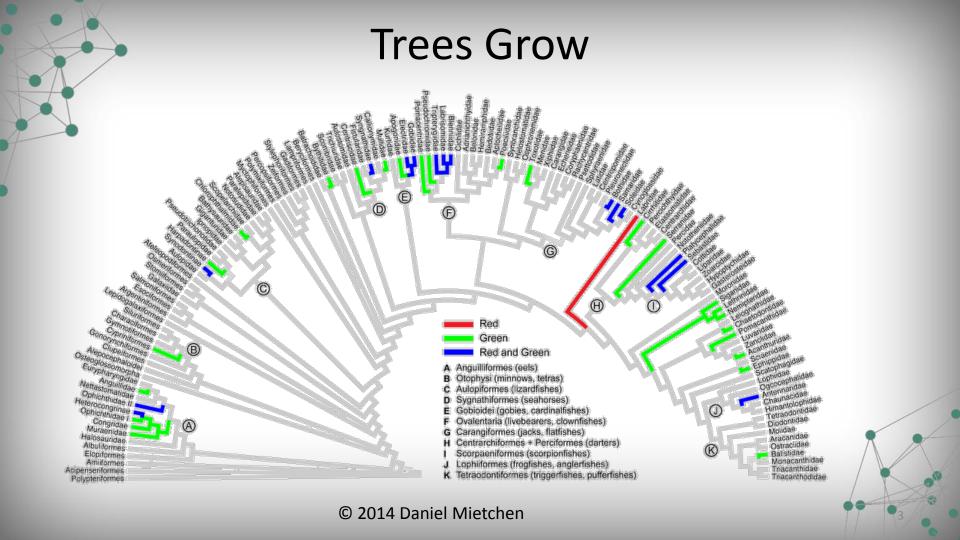University of Illinois at Urbana-Champaign
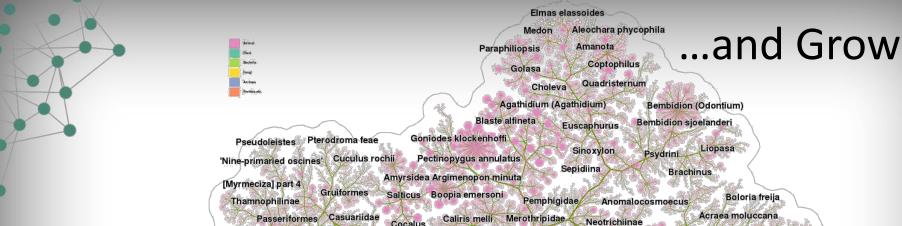
Trees and Hierarchies

- Tree
  - n nodes, n-1 edges
  - minimally (simply) connected
  - Single parent node can have multiple child nodes (siblings)

- Hierarchy
  - acyclic directed graph
  - Typically height-based layout used

root node

tree depth = 2

adding this edge means the child node has two parents in the hierarchy, which would no longer be a tree

Trees Grow

Red
Green
Red and Green

A Anguilliformes (eels)
B Otophysi (minnows, tetras)
C Aulopiformes (lizardfishes)
D Syngnathiformes (seahorses)
E Gobioidei (gobies, cardinalfishes)
F Ovalentaria (livebearers, clownfishes)
G Carangiformes (jacks, flatfishes)
H Centrarchiformes + Perciformes (darters)
I Scorpaeniformes (scorpionfishes)
J Lophiiformes (frogfishes, anglerfishes)
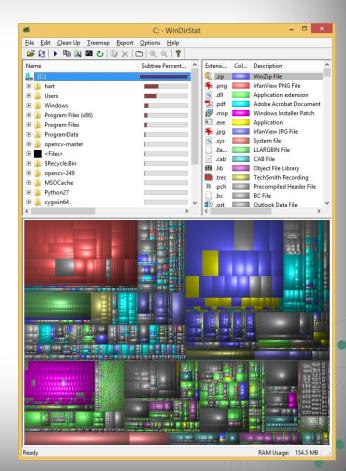K Tetraodontiformes (triggerfishes, pufferfishes)

...and Grow

Yifan Hu's Tree of Life
http://yifanhu.net/TOL/

Treemaps

- Schneiderman, ACM Trans. on Graphics 11(1), 1992, pp. 92-99
- Maps quantities to area
- Color used to differentiate areas
- Shading delineates hierarchical regions
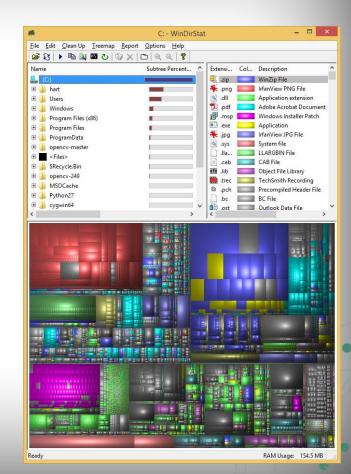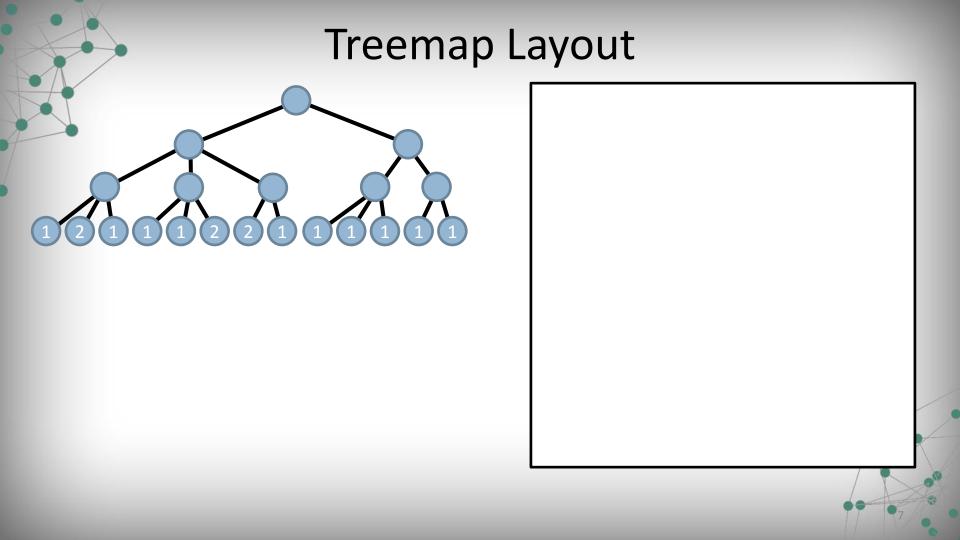- Hue nominal category axis

Treemaps

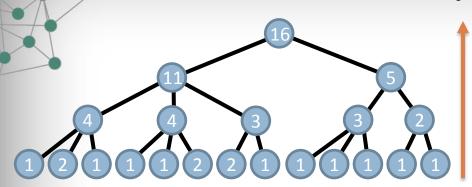**Quantitative**

Position

Length

Angle

Slope

Area

Volume

Density

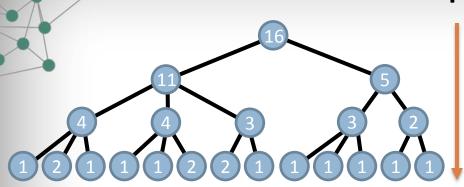Saturation

Hue

Treemap Layout
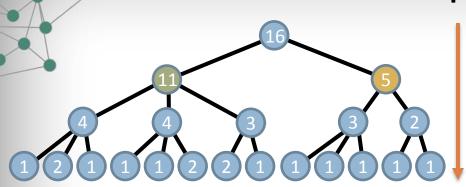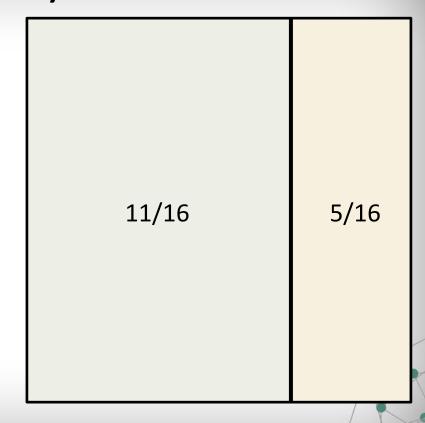
Treemap Layout

- Set parents node values to sum of child node values from bottom up
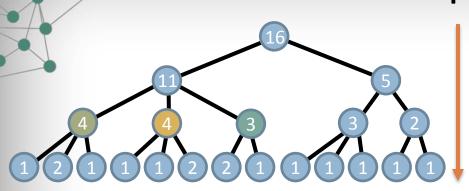
Treemap Layout

- Set parents node values to sum of child node values from bottom up

- Partition based on current node's value as a portion of parent node's value from top down

Treemap Layout

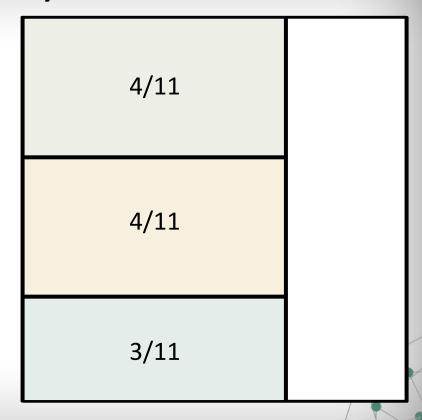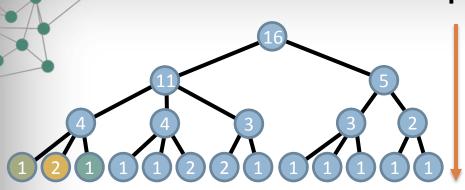

- Set parents node values to sum of child node values from bottom up
- Partition based on current node's value as a portion of parent node's value from top down

Treemap Layout

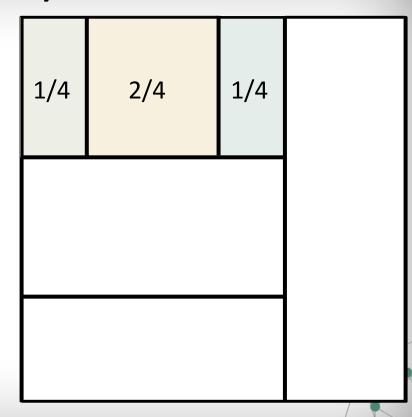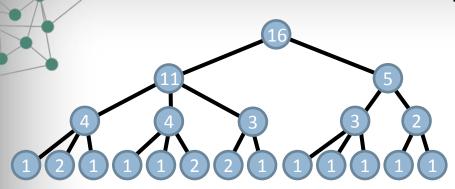- Set parents node values to sum of child node values from bottom up

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Treemap Layout

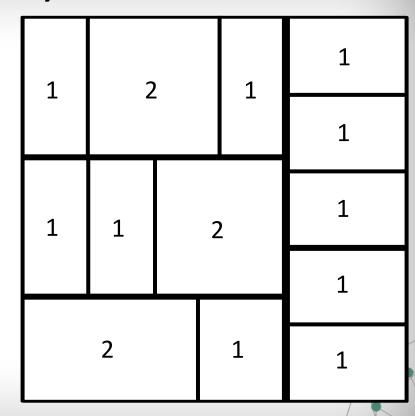- Set parents node values to sum of child node values from bottom up
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Treemap Layout

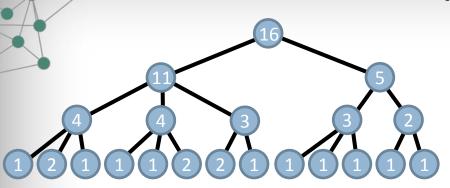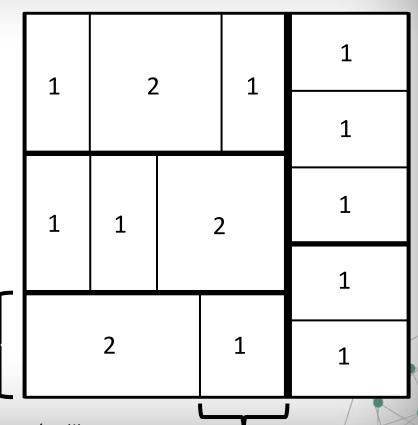- Set parents node values to sum of child node values from bottom up
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Treemap Layout

- Set parents node values to sum of child node values from bottom up
- Partition based on current node's value as a portion of parent node's value from top down

we can also see that area is not a good choice to represent the ordinal data

3/11

3/11 * 11/48 = 1/16 (!)

1/3 * 11/16 = 11/48