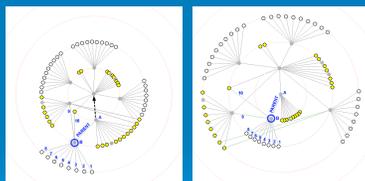


# Large Scale Radial Graph Drawing

Cody Robson

## Graph Exploration Radial Layout: Constrains graph to rings



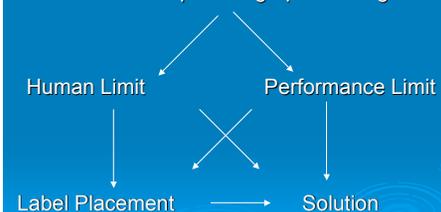
User can shift focus to avoid panning.

## Radial Layout Papers

*NicheWorks—Interactive Visualization of Very Large Graphs*  
Wills, G. J., Proceedings of Graph Drawing '97, 1997.

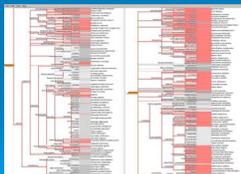
*Animated Exploration of Graphs with Radial Layout*  
Ka-Ping Yee, Danyel Fisher, Rachna Dhamija, and Marti Hearst, Proc InfoVis 2001.

Goal:  
Scale up radial graph drawing



## Data:

Network-focused  
InfoVis 2003 Contest: Trees



## Human Limit:

- Radial Animation
- Slow-in Slow-out
- Maintain neighbor ordering

## Possible:

- Intermediate focus for large transitions
- Aggregate nodes
- Hide nodes
- Fade-out Fade-in transitions
- Focus + Context

## Performance Limit:

- Use shading, not outlining
- Tilt quads to exploit fog
- Texture lookups for coloring
- Utilize texture filtering

## Possible:

- Point sprites / Imposters
- GPGPU graph layout

*Interactive Information Visualization of a Million Items*  
Jean-Daniel Fekete and Catherine Plaisant, Proc InfoVis 2002.

*Multi-Level Graph Layout on the GPU*  
Yaniv Fishman and Ayellet Tal, Proc InfoVis 2007

## Fallback: Label Placement

- Greedy with priority
- 2D Bounding box collision detection
- Layout at multiple scales and filter

## Possible:

- Alter layout to avoid filtering?

## TreeJuxtaposer: Scalable Tree Comparison using Focus+Context with Guaranteed Visibility

Tamara Munzner, Francois Guimbretiere, Sarder Tasiran, Li Zhang, and Yunhong Zhou, SIGGRAPH 2003

## Dynamic Map Labeling

Ken Been, Member, IEEE, Eli Daiches, and Chee Yap, InfoVis2007

## On labeling in graph visualization

Ugur Dogrusoz Konstantinos G. Kakoulis, Brendan Madden and Ioannis G. Tollis, Information Sciences: an International Journal

## Tools:

OpenGL  
FLTK (Fast Light Toolkit)  
IrrXML

Shaders? GLSL  
GPGPU? BrookGPU, libSH

## Progress:

Week 1: Initial OpenGL setup  
→ Week 2+3: Animated Radial Layout  
Week 4: Scale, determine path  
Week 5+6: Complete program  
Week 7: Presentation / Write-up

## Program:

- UI Skeleton
  - Picking, node info display
  - Radial graph layout
- In Progress:
- Slow-in Slow-out
- Next:
- Animation
- ~~ End of Week 3 ~~