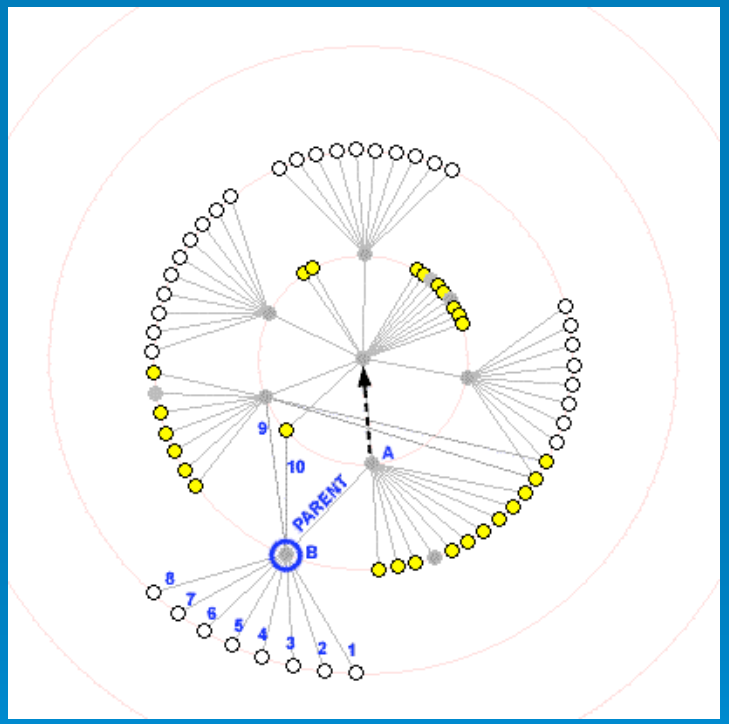
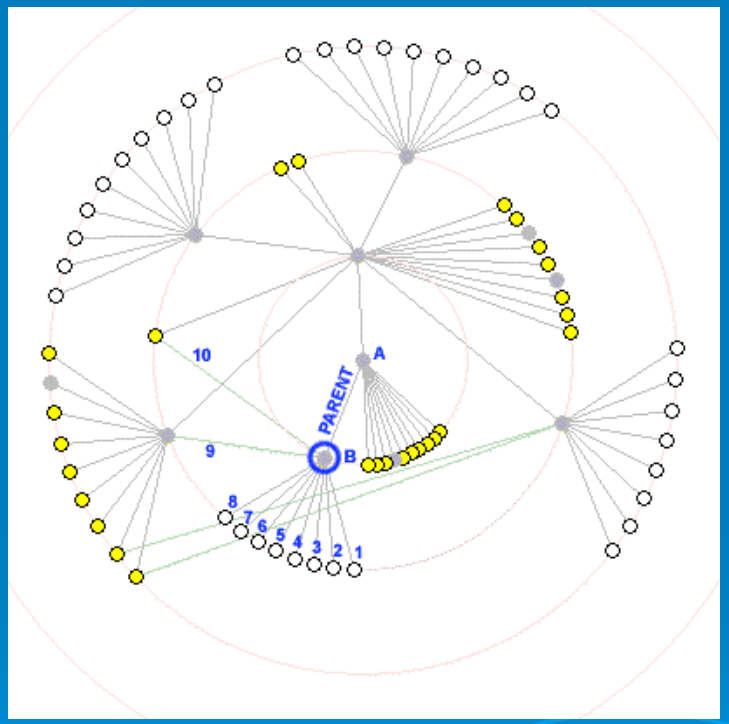
Large Scale Radial Graph Drawing

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

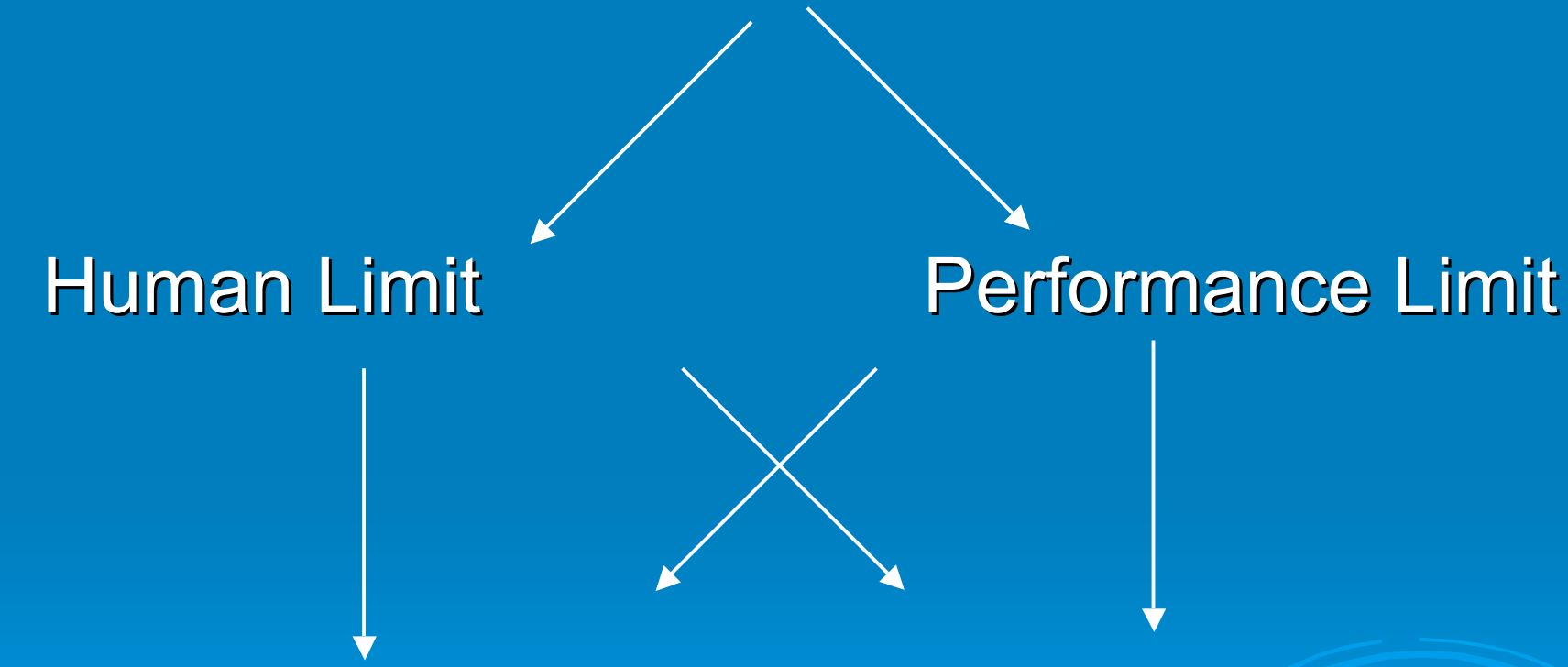
Wills, G. J.,, Proceedings of Graph Drawing ’97,1997.

Animated Exploration of Graphs with Radial Layout

Ka-Ping Yee, Danyel Fisher, Rachna Dhamija, and Marti Hearst, Proc InfoVis 2001.

Goal:

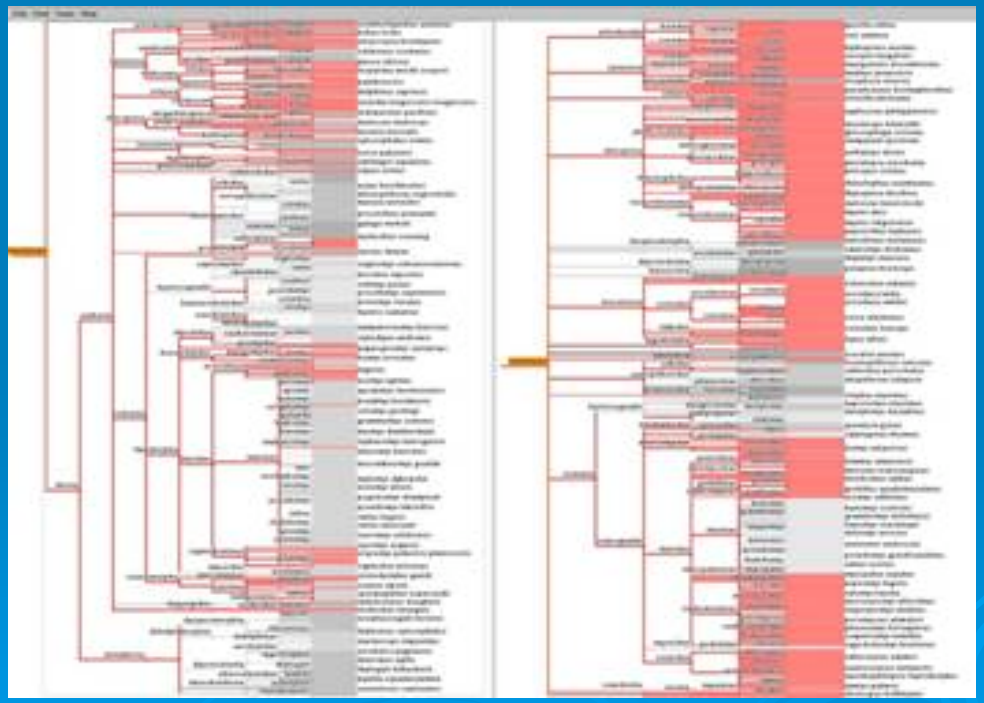
Scale up radial graph drawing



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 Frishman 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, Serdar 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 ~~