SIGGRAPH VRML 3D Ph.D. Conetree

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Abstract
This paper describes the work-in-progress of a VRML 3D conetree to visualize Ph.D. graduates and their Ph.D. thesis advisors in the field of computer graphics. As part of the SIGGRAPH history project chaired by Carl Machover, this VRML 3D conetree debuts publicly at the 25th conference celebration at SIGGRAPH 98, July 1998, in Orlando, FL. This conetree allows a VRML-enabled browser to visualize Ph.D. contributors to the field of computer graphics and to trace their influences and academic progeny. The database developed may seed further studies of the field's contributors. The initial phase of this project (using Ph.D. advisors/graduates) provides a hierarchical (if arbitrary) view of part of SIGGRAPH's academic structure.

Introduction
Conetrees were first developed by George Robertson, Jock Mackinlay and Stuart Card while at Xerox PARC. Their work: "Cone Trees: Animated 3D Visualizations of Hierarchical Information" was presented at SIGCHI '91, pgs. 189-194. A conetree is a 3D representation of a tree structure. Conetrees have been shown to be very effective information visualization tools for large data sets that are broad, shallow and hierarchical. In a conetree representation, the root of a tree (represented by a cube, a sphere or some other appropriate object) is located at the tip of a transparent cone. The children of the root node are arranged around the base of the cone. Each child can be the root node of a subtree, which is represented in a recursive fashion by a cone whose tip is located at the object representing the child.

This conetree implementation visualizes simple hierarchical relationships occurring in the data with a standard G=(V,E) graph with vertices and edges implementation. Thus, each line in a flat, ascii, datafile has a vertex and a list of its children. The output of the program is a VRML 'cone.wrl' file. Up to four lines of text can be associated with each node (vertex).

This database is just the beginning documentation to the human side of the meteoric rise of computer graphics. Few disciplines have the benefit of creating such biographical materials while almost all the players are still alive. We hope that the start we have made will encourage further expansion to other
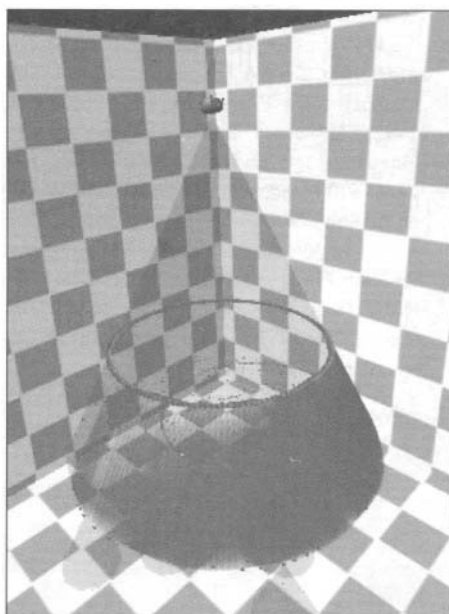

Figure 1: Conetree with more than 700 entries. See page 97 for image in full color.

academic degrees or titled positions (such as graphics software engineer, degree notwithstanding!). We will be seeking avenues for such an expansion of the database so that we may more fully capture the human aspect of the computer graphics phenomenon. There are now more than 700 people in the SIGGRAPH conetree database.

The Web Site
At the Web site **http://iml.millersv.edu /SIGGRAPH_tree/index.html,** you can view the entire SIGGRAPH VRML 3D Ph.D. conetree. This will load the file: cone.wrl.gz into your VRML browser The file is gzip compressed and it's still greater than 3MB. In uncompressed form, it is over 26MB. You can also view the VRML 3D conetree data in raw html format. The VRML 3D conetree can also be viewed in 2D using a Java applet. The applet shows the 2D graph. If you are not in the SIGGRAPH conetree database you can add your data with an easy to fill out form at the Web site. If you have a long list of Ph.D. students that you have supervised, you can fax the information to +1-717-871-2320. We would rather the database be inclusive rather than exclusive, so we are happy to include any field that could be of potential interest to the SIGGRAPH community at large. Example views from the conetree are shown below.

The DataBase
The database is a flat ASCII file, and each line has the following format:
~vertex_name_text:secondlineoftext:3rdline: 4thline~numberofchildren~children
Where: 'children' is a list of the subscripts of the vertices. Unfortunately, no spaces are allowed in the text.

Here is a simple data set (Graphics has four children: Coons, Van_Dam, Foley, Bresenham): Coons has one child: Sutherland.
~Graphics::::~4~1,2,3,4
~Coons::::~1~5
~Van_Dam::::~0~
~Foley::::~0~
~Bresenham::::~0~
~Sutherland::::~0~
Our example datafile of Ph.D. advisors and their Ph.D. graduates looks like this:
~LastName:FirstName:Date:Institution~Num berOfChildren~ChildrenList

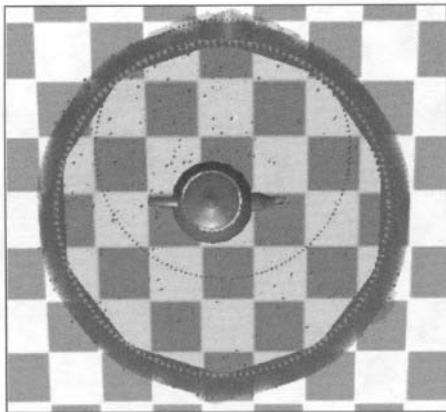*Figure 2: View from the top of the conetree. See page 97 for image in full color.*

Figure 4: Preliminary sketch of the display area at SIGGRAPH 98. Courtesy of Jeff Callender. See page 97 for image in full color.

Acknowledgments

References

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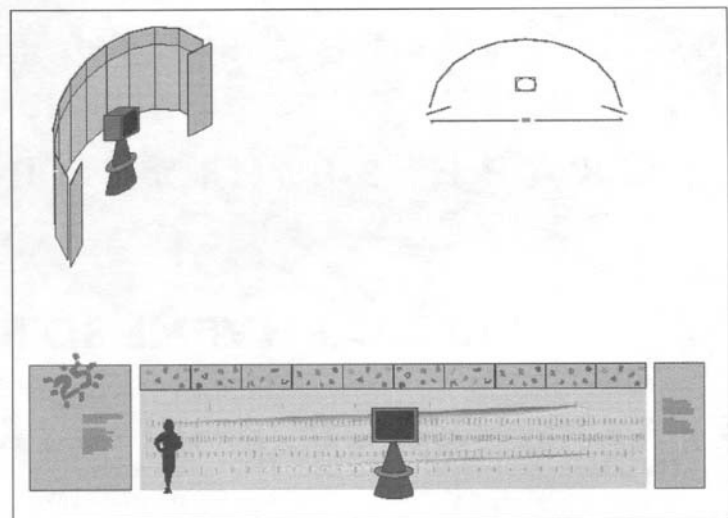Millersville, PA 17551
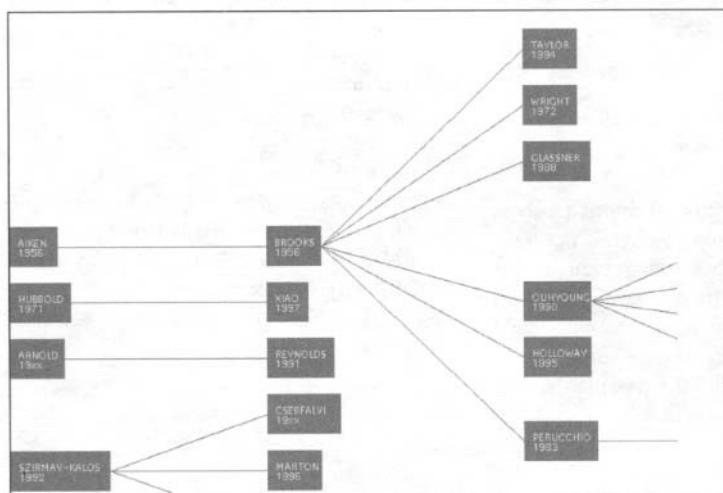Email: **webster@cs.millersv.edu**

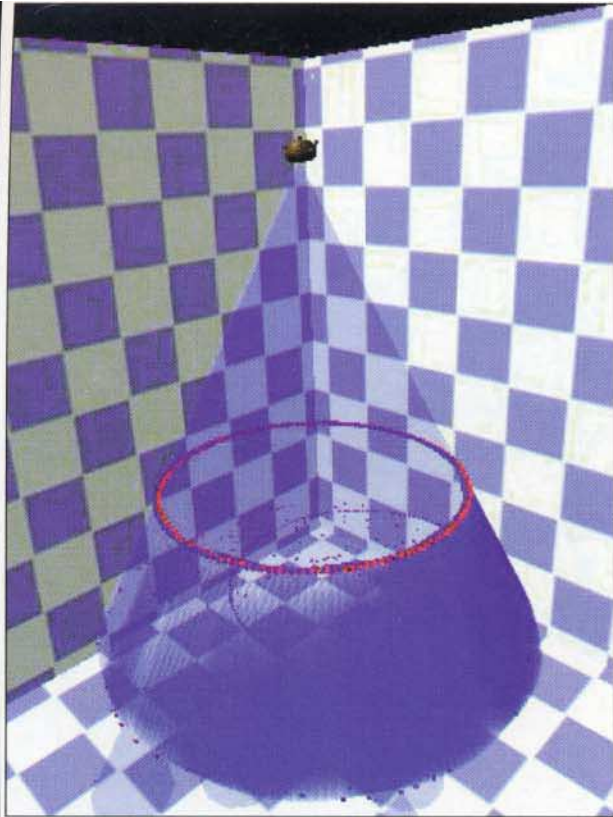*Figure 3: Sample of SIGGRAPH conetree data in 2D with Java applet.*

Figure 1: "SIGGRAPH VRML 3D Ph.D. Conetree" by Dr. Roger W. Webster. See pages 43-44.
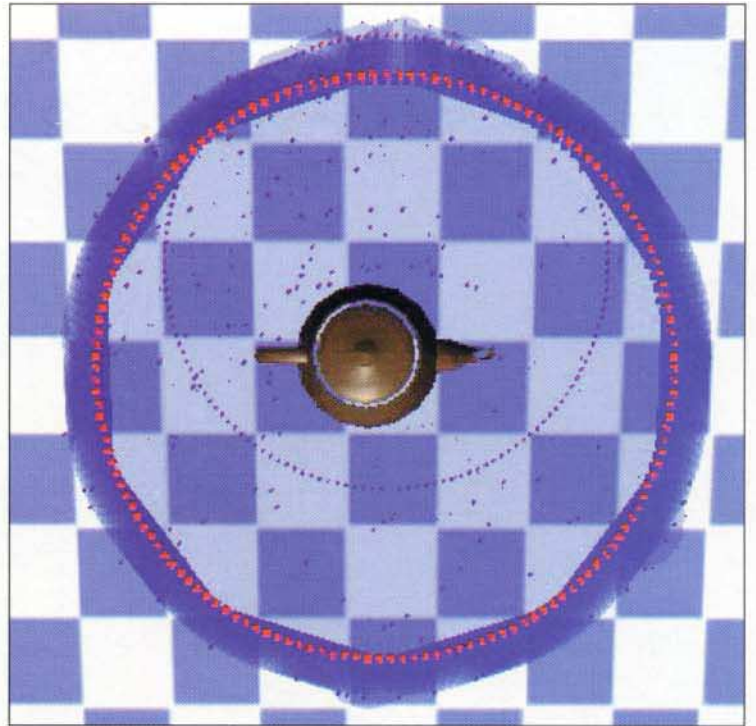

Figure 2: "SIGGRAPH VRML 3D Ph.D. Conetree" by Dr. Roger W. Webster. See pages 43-44.
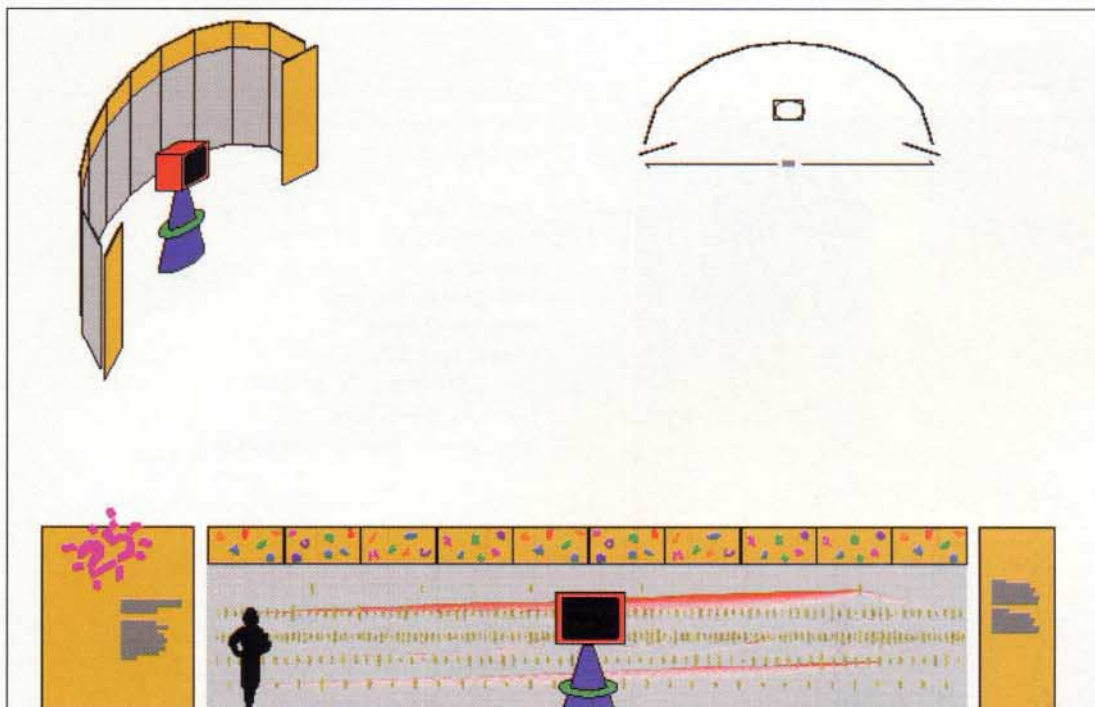

Figure 4: "SIGGRAPH VRML 3D Ph.D. Conetree" by Dr. Roger W. Webster. See pages 43-44.