Visualization techniques for circular tabletop interfaces


1.1 main point of the paper as the authors see it. Lawrence

1. Introduction
   a. Personal Digital Historian
   b. Round table
      1) most architectures, furniture and documents are rectangular
      2) when multiple people gather around a display, no single orientation is ideal for everyone
      3) can a system be designed that can support a strong rectilinear directional preference and at the same time provide an entire group the opportunity to work on the same set of objects?
      4) tabletop display with top projection onto a standard whiteboard

2. Related Work
   a. short section on examples
      1) DigitalDesk only works for one person
      2) Living Memory project displays information in a fixed direction
      3) InteracTable considers rotation and shuffling of documents only very briefly
   b. most tabletop surfaces deal with only Cartesian coordinate systems
   c. claim that no previous interface has been proposed that organizes and orients shared documents in a polar coordinate system when the interface site between people who are looking from different angles
   d. similar to ZoomScape

3. Tabletop Orientation and User Position Determination
   a. entire interface can be rotated in either direction
   b. allow menus to be positioned along the perimeter of the tabletop wherever a user is sitting
   c. these are supposed to support both individual and group viewing preferences

4. Document Orientation
   a. develop novel visualization and interaction schemes to facilitate
      1) convenient re-orientation of any documents on the surface
      2) ease of passing documents around surface
   b. maintain two independent polar coordinate systems
      1) for table
      2) for individual documents
   c. document orientation is handled automatically
1) centric vs. magnetized orientation

5. Document Size
   a. fisheye technique used
      1) central focus
         a) documents become larger at the center of the table
         b) used for sharing with all users in the center of the table
      2) central black hole
      3) used for situation in which one user wants to show documents to other users
         4) documents become smaller in the center of the table
      b. fisheye deformation works well because the deformation center is not arbitrary

6. Hierarchy Visualization

6.1. Hierarchy Presentation
   a. to scale to large number of documents, support hierarchical representation of data
   b. similar to standard GUI file system representation
   c. default layout is comparable to parabolic browser

6.2. Interaction and animation
   a. key problem is where to display children when a user opens a node
   b. flower animation
   c. fan drag and drop

1.2 main point of the paper as you as a reader see it. Erika

The author presents their version of a "lazy-susan" approach to tabletops. The lazy susan may not be appropriate for all desired systems, however their use of polar coordinates is a unique way of approaching the table system. Perhaps there are other coordinate systems that could be evaluated for the horizontal display?

There are a couple of issues that the reader can identify within the paper:

1. The author does not clearly indicate the specific need for circular tables. The ideas they propose could apply just as well to non-circular, with a central point being established in the middle of the table. Are there tasks we could perform better on circular tables that square, or oblong are unable to achieve?

2. Secondly, the motivations behind the research seem unclear. Is this a mere exploration of data presentation techniques? This is all well and good for small
data sets (as noted with the fish eye picture browsing), or limited needs, but what about comprehensive systems? Are these methods the ideas behind simple file browsing applications? Are we looking to create a tabletop-friendly OS windowing/UI system? Again, what about more comprehensive systems? If we carry along with the general windows-based operating systems, how do we, in tabletops, allow for smooth transitions between applications?

The researchers seem to be exploring potential options for data visualization. When we get to something more comprehensive, we'll have an artillery of interaction options (and prior testing that has established what works well under which situations)

1.3 How this paper applies to moving this research forward and to our research – Mahmudul Hasan

- Experimentation can be carried out to determine how the use of alpha component of the polar coordinate system as a dimension to control the deformation of image/document size affects the cognitive effort of the user.
- We can consider the integration of novel input devices into the circular tabletop interface, while this study only used a mouse-like input device.
- New visualization techniques like Treemaps can be developed that exploit the circular context of a circular tabletop interface.
- While this study involved the interactive viewing and navigation of personal digital photograph databases, it can be studied how well the suggested techniques apply to other application domains, such as business and organizational meetings, where the uses work also with textual documents, not only images.

We can also study how the user control of beta component affects the suggested techniques in this paper.

1.4 Notes: combine 1, 2, and 3 with comments from the class discussion and your thoughts. Carmen

1. one of the main benefits of tabletop is that digital files can be compressed to control clutter

2. the geometry of a round table allows for more people to sit around the table without feeling cramped or generating a hierarchy.
3. IMPORTANT ASIDE - the name of your product/paper is extremely important! May determine the amount of attention your paper receives.

MAIN THREE POINTS
- general consensus is that round shape of table is more democratic and collaborative
- polar coordinate system is better for collaboration over Cartesian
- the best approach is more like a lazy susan ie: just the inner circle rotates, but personal space is maintained.