Week 7 Paper 1 Discussion Notes

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The Paper

Discussion Notes
1.1 Main point of the paper as the authors see it – Darren Andreychuk

- We have previously discussed interaction issues on digital tabletops and how they are different from the interactions on vertical desktop displays. The main point of this paper as the authors see it was to propose a possible list of finger and hand gestures for interacting on tabletops.
- The authors proposed a prototype furniture layout application called RoomPlanner. This prototype demonstrates new interaction techniques that make use of multiple fingers, hand shapes and gestural input.
- They proposed the following gestural techniques for finger interactions: tap, double tap, flick, and catch. Flat hand, vertical hand, horizontal hand, and tilted horizontal hand were proposed for single hand interactions. Two vertical hands and two corner-shaped hands were proposed for two handed interactions.
- This paper also provides early feedback from participants on the gestures.
- This paper was published in 2003 and comes very early in designing interaction techniques for tabletops. The authors admit this and state that a lot more research needs to be conducted in this area considering their work to be a starting point.

1.2 Main point of the paper as you as a reader see it – Lawrence Fyfe

- Related Work
  - No mention of non-computer tabletop studies was found in the section of related work.
- Gestures: Single Finger Techniques
  - Showing furniture picture on selection is a good idea.
  - Why did they use pie menus? It seems interesting, but was not explained.
  - Double tapping is a more distinct gesture, but that does not really explain why it is better than dwell time.
Menu selection gesture seems awkward; why not have two hands? They make this sound like an important feature but do not ultimately justify the need to have one handed selections; especially with the absence of asymmetric gestures.

Flicking is interesting but having an object sit half on the frame seems like an odd choice given their admission that touch does not work on the frame.

Catching seems convenient but would be hard to use in all situations, i.e. when many objects are grouped together. This issue is brought up by table users later in the paper; could be good for large tables.

- **Gestures: Two Finger Techniques**
  - Two finger rotation is good but how far can an object be rotated using this technique? Lifting pivot finger alleviates this difficulty.
  - Authors mention about scaling though it is not implemented.
  - Parameter adjustment widget seems difficult to use. Finger distance controlling granularity size seems difficult.

- **Gestures: Single Hand Techniques**
  - Flat hand room rotation could present difficulties. Why do they have it spring back after rotation?
  - Vertical hand sweeping gesture is a good mapping but shouldn’t this use more than vertical?
  - Horizontal blocking gesture might be better for sweeping. Isn’t the application about collaboration? Authors do mention competitive aspect.
  - Tilted horizontal hand is novel, which only works for top-projected tables. This gesture is not really subtle since it will be obvious to anyone else at the table. Hand might not be the best projection surface.

- **Gestures: Two-handed Techniques**
  - Asymmetric gestures sound really interesting. Too bad they are not implemented.
  - Two vertical hand gesture seems good.
  - Editing plain is awkward. No way to resize vertically seems like a serious limitation.

- **User Feedback**
  - Use of constructive interaction technique seems good.
  - In single hand technique feedback, dwell time is mentioned again which has not been implemented.

Notes on 1.1 and 1.2 from the group discussion:

- Gesture is movement and posture is hand-placement on the tabletop.
- In case of gesture, system response comes at the end but for touches, system responses are continuous.
- Gesture is something that one has to remember. It is a preset action which the system has to recognize. It is like a keyboard shortcut which is symbolic.
- A sign is anything that stands for something other than itself, for example, a touch on the tabletop.
- Avoid menus – we perform actions in real world without menus. However, menus allow efficient spacing.
- Types of menus: markup menus, flow menus, surface menus etc.
- People do not prefer menus anymore because they want to perform their actions faster.
- Menus can be replaced with finger actions, as in CrossY.

1.3 How this paper applies to moving this research forward and to our research? – Erika Harrison

- While the paper offers a variety of different gestures that we can store in our designer's toolbox, there are a number of issues that arise, which we can address with further research. Given the context of the DiamondTouch table, pose-related gestures (eg. horizontal/vertical) require the definition of orientation. What happens if someone sits at the corner of the table? Further, the bounding box which is used to identify the metadata visualization, and identify other poses, requires alignment with the edges of the table. Again, orientation influences this transition over to other surfaces.
- Further, much of these interactions assumed either identifiable users (as is available on the DiamondTouch surface), or working within a private space. What happens if two users are interacting at the same time? What if they attempt to apply gestures together, or separately, on the same object? Can one design gestures that require multiple people?
- Given the concept of the pose of a contact, how can we have different poses equate to different actions? What is intuitive?

Notes on 1.3 from Lawrence Fyfe:

- Privacy of pencil writing/erasing example brings up a question: do all traditional interaction types need to be mapped to computer tabletops?
- Private gesture types are very interesting; like gang signs!
- How well would actual partitions work with computer tabletops?
- Multi-person gestures could be a good area of investigation.

Main points from the group discussion:

- This paper provides of a variety of ideas – a list of gestures for user interactions on tabletops.
- The authors categorized user interactions, characterized gestures, and introduced whole hand interaction.
- They also provide a variety of menu ideas.
- Problems: (i) the authors propose a list of gestures which they do not do anything with; (ii) many of their proposed gestures require DiamondTouch.