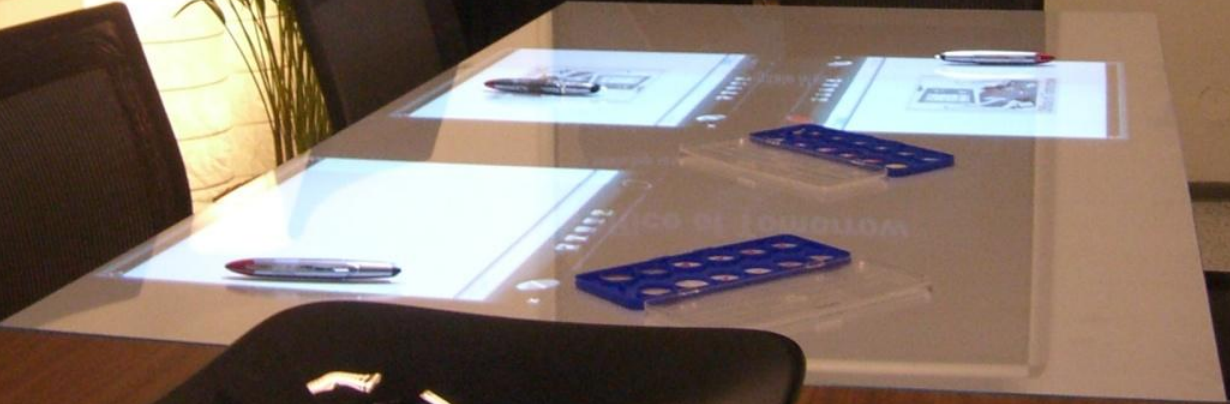
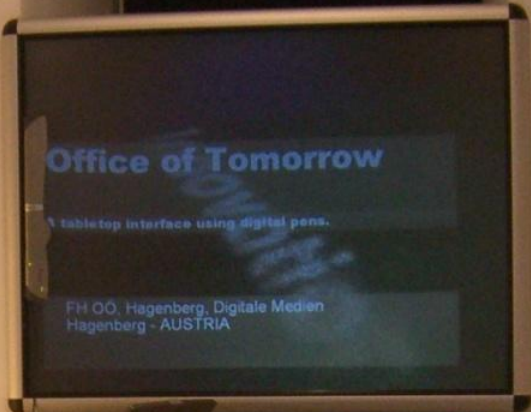


Occlusion-Aware Menu Design for Digital Tabletops

Digital Tabletops



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Bernard Doray, Paul To
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Motivation

Reach-ability and menu-placement play an important role on digital tabletops *

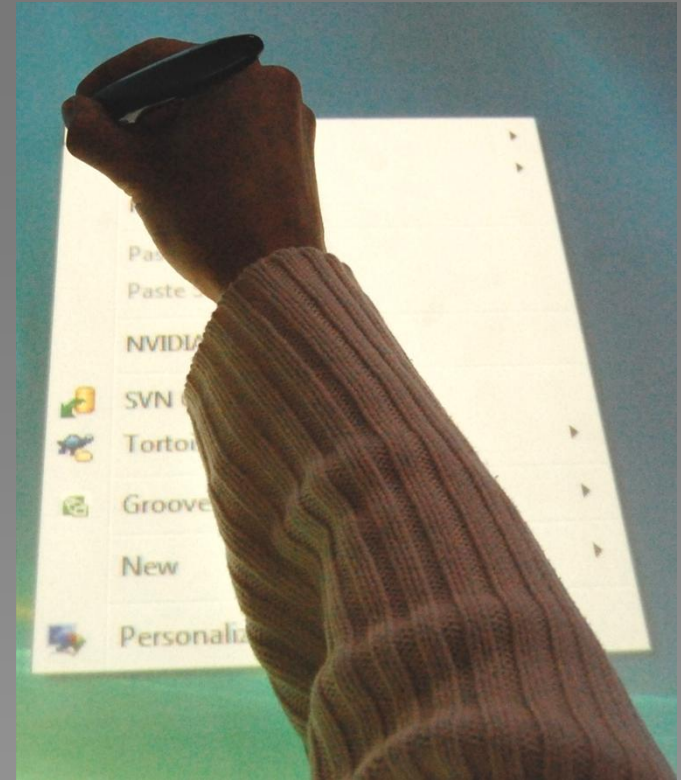


**)Toney, A. and Thomas, B. H. 2006. Considering Reach in Tangible and Table Top Design. In Proceedings of the First IEEE international Workshop on Horizontal interactive Human-Computer Systems (January 05 - 07, 2006). TABLETOP. IEEE Computer Society, Washington, DC, 57-58.*



Motivation

- **Occlusions** are influenced by
 - menu placement
 - handedness (left- or right-handed)



Further aspects:

- Fixed position menus not appropriate
- Menus at **activated position** preferred

Related Work

- Menu Occlusion (Leithinger et al.)

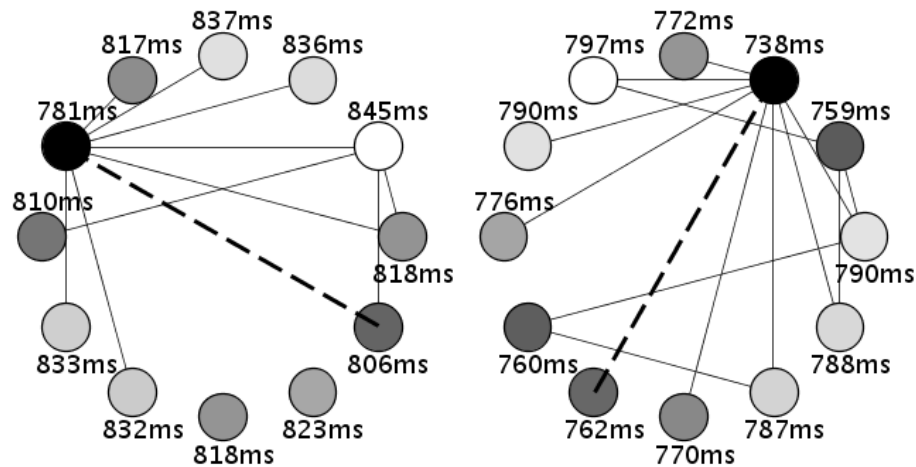


D. Leithinger and M. Haller, 2007. "Improving Menu Interaction for Cluttered Tabletop Setups with User-Drawn Path Menus". *Horizontal Interactive Human-Computer Systems, 2007. TABLETOP 07. Second Annual IEEE International Workshop on*, pp. 121-128, 2007.



Related Work

- User Handedness (Hancock et al.)



Hancock, M. S. and Booth, K. S.: Improving Menu Placement Strategies for Pen Input. In *Proc. of GI '04*, 221-230.



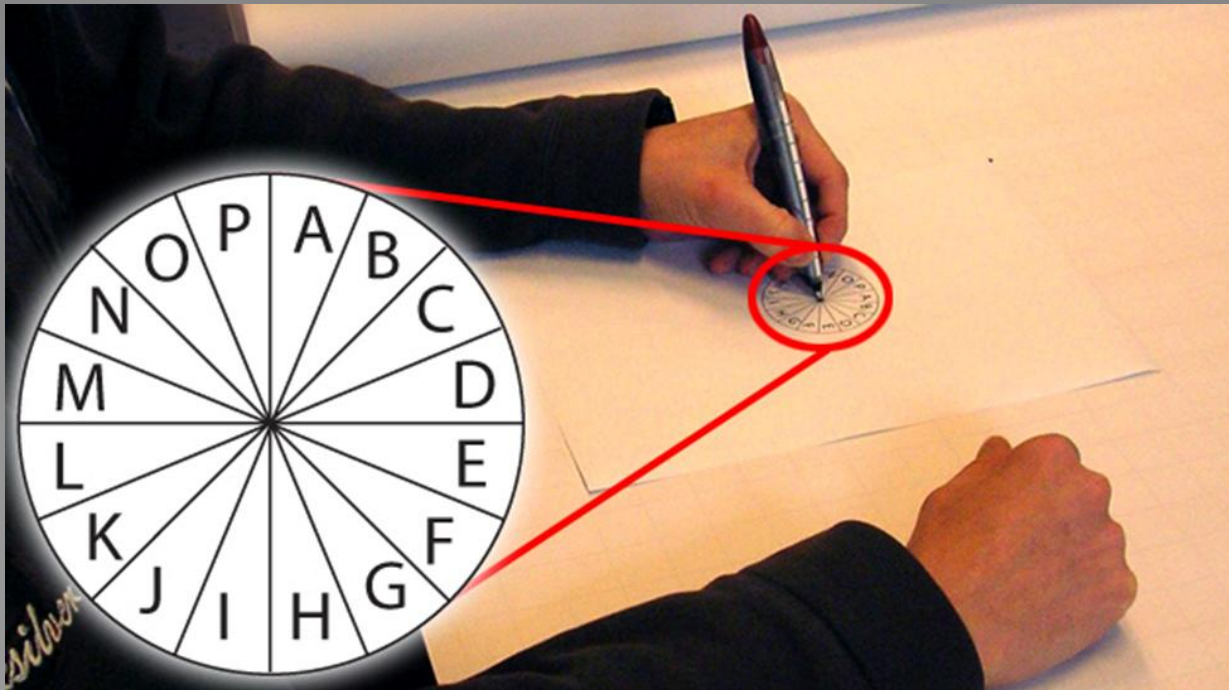
Occlusion

Observation



Experiment - Task

- 18 participants (3 left-handed, 15 right-handed)
- Occlusions of circle with 16 segments



Experiment - Results

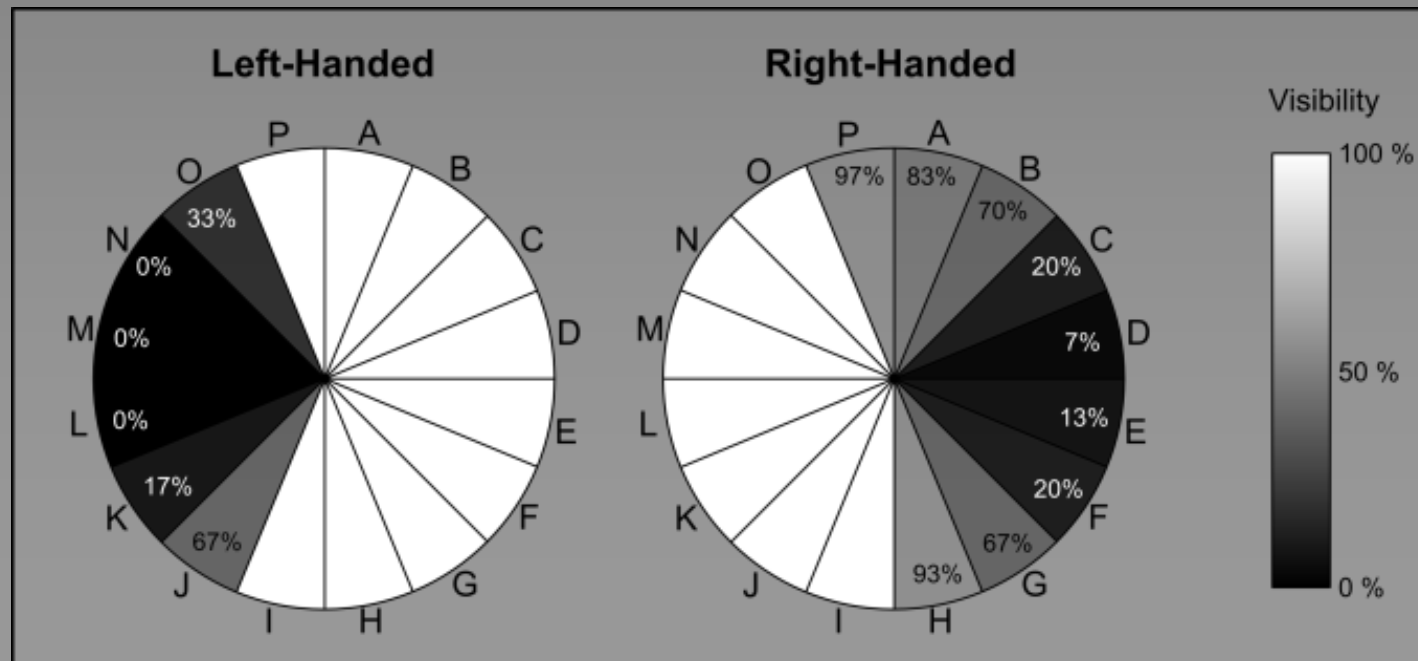
Nr. visible segments out of 16

LEFT HANDED

RIGHT HANDED

11.17

11.70



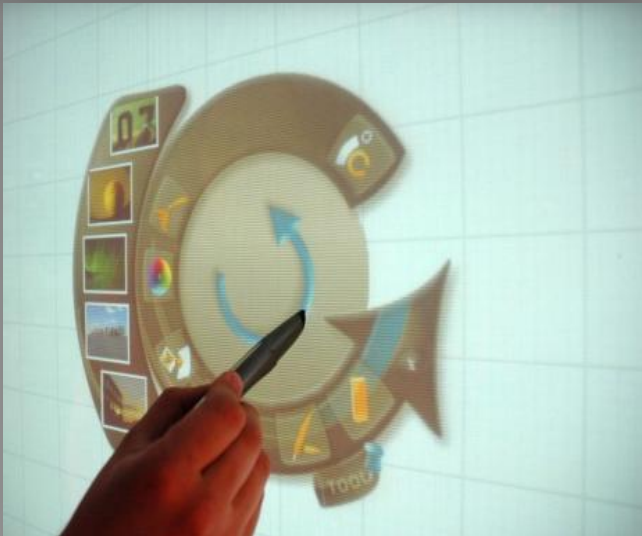
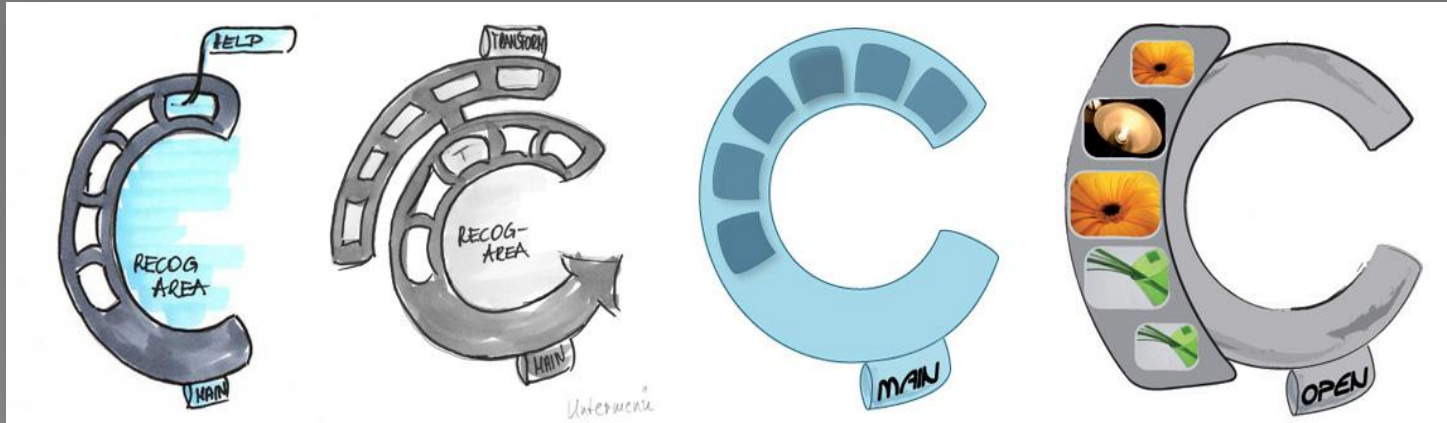
Implementation



FLUX



Menu Designs



Menu Design

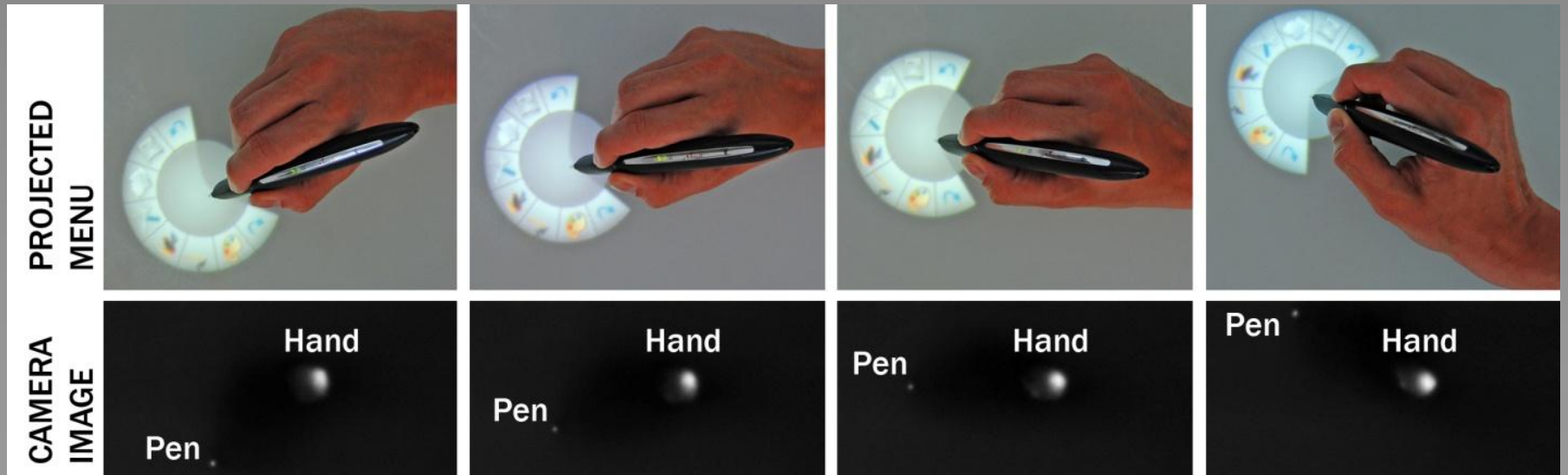
- Menu for tabletops with direct pen input
- Items placed in not occluded areas only
- Occluded area used for gesture input





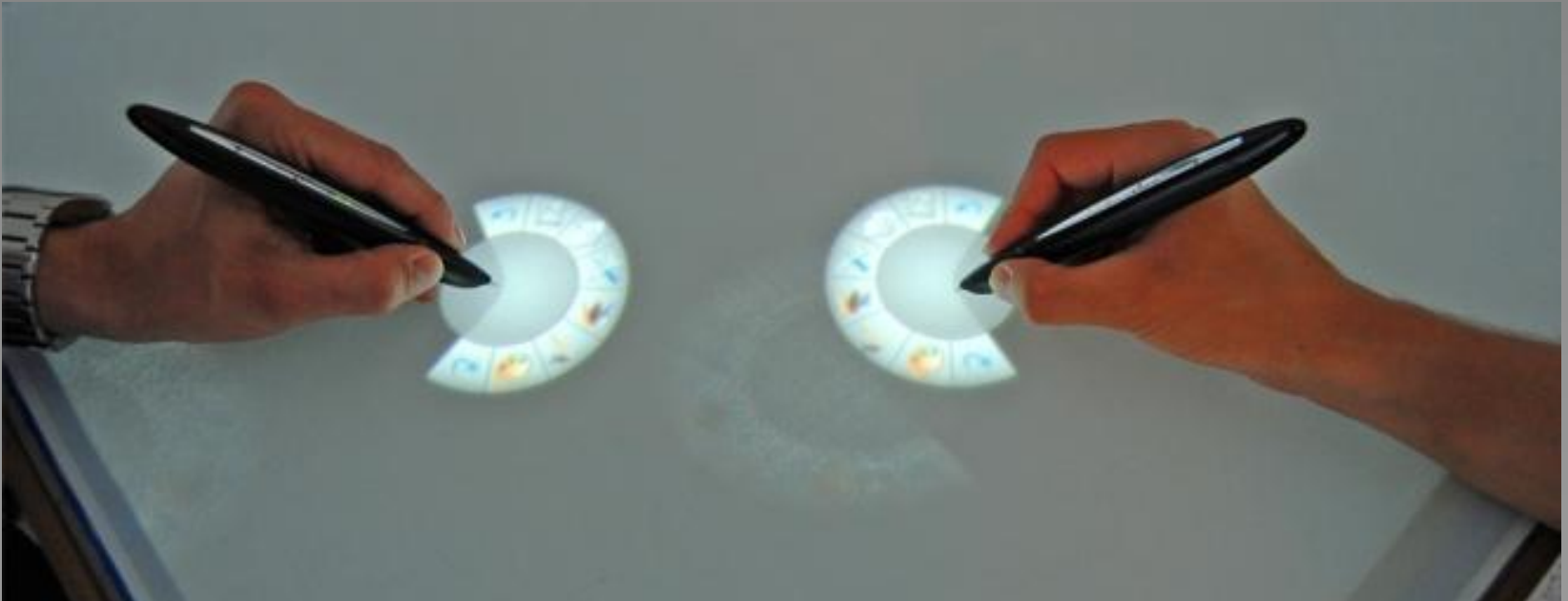
Adaptive Placement

- Users tend to rest their hand on the surface when using direct pen input on tabletop
- Combination of FTIR multi-touch tracking and Anoto pen tracking



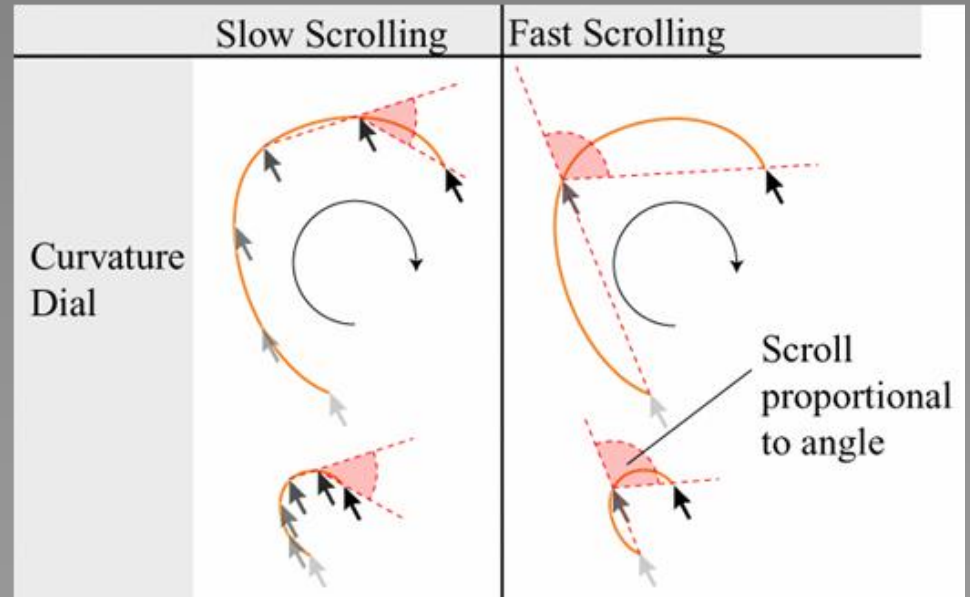
Multi-User Support

- Adaptive placement allows to adjust menus for multiple users



Gesture Area

Zooming gesture



Smith, G., Schraefel, M., and Baudisch, P. Curve Dial: Eyes-free Parameter Entry for GUIs. In CHI 2005 Extended Abstracts (demo paper), Portland, OR, Apr 2005, pp. 1146-1147.

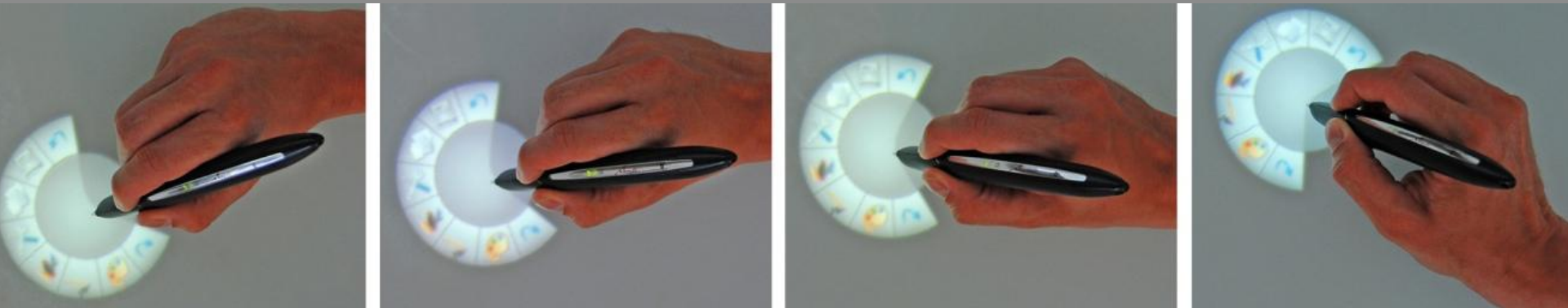




come to our interactivity booth

Questions

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