

## Interactive Shared Displays



MULTI – Collaborative system with interactive tabletop and three interactive walls

## Input Technologies



Mouse and laser pointer used in the study

## Comparative User Study

### Motivation

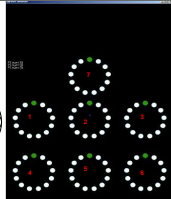
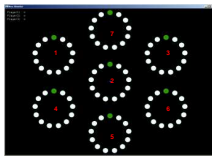
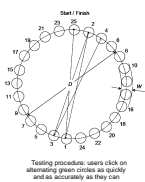
- Investigate differences between interactive tabletop surface and wall surface
  - People more familiar with vertically mounted displays
- Investigate differences between input technologies (mouse, laser pointer)
  - People more familiar with mice
- Evaluate collaboration potential; i.e. how performance scales with number of users
  - Group performance should scale

### Experiment

3 people work on collaborative task

3x2x2 design:

- number of people
- input device
- display surface

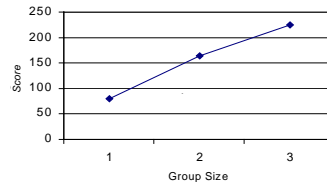


\* only 2 screens are used

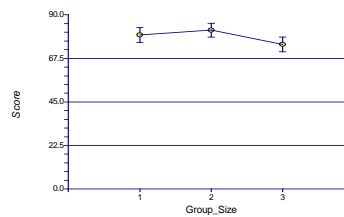
Simultaneous overview of all targets on the wall and table surface. The positions of the players are marked. Only one surface was active at any given time.

## Findings

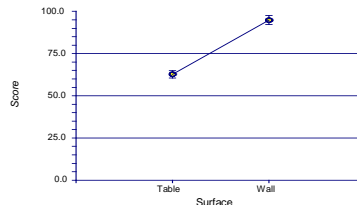
Group performance increases with more members



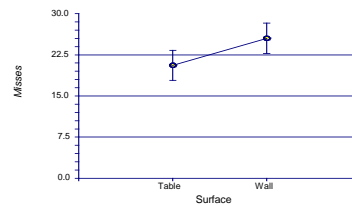
Individual results approximately equal



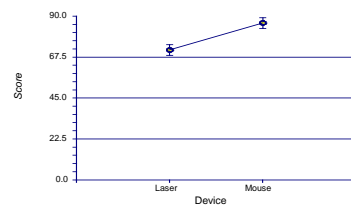
Walls faster than Tables (51.2% higher scores)



Users missed 24.4% more often in wall condition; difference not statistically significant.

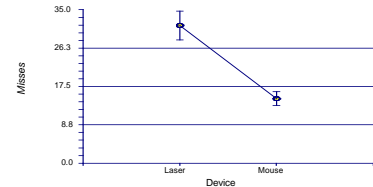


Mice faster than laser pointers (scores 20.8% higher)

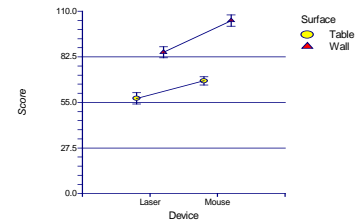


\* Bars on graphs show standard error.

Lasers are less accurate than mice (213% more misses)

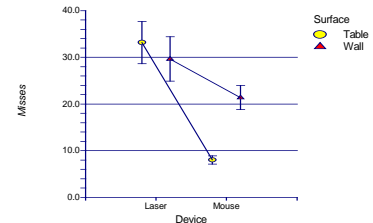


(Pointing device) x (working surface) interaction for total score  
All pairings are distinct



(Pointing device) x (working surface) interaction for misses

(mouse, table)-[anything], and (mouse, wall)-(laser, table) are different



## Conclusion

Mice faster than laser pointers in co-located collaborative system.

Vertical surfaces yield higher pointing performance, compared to tabletops.

Tabletops might be better for tasks with a "top view" (e.g. maps).

Future work: explore what factors favour a particular combination of surface & device.

E.g. walls seem better for higher interactivity, direct pointing devices seem to provide better awareness.

## REFERENCES

1. ISO/IEC/JTC 1/SC4/WG1 N147: Ergonomic requirements for office work with visual display terminals (VDTs) - Part 9: Requirements for non-keyboard input devices, International Organization for Standardisation, May 25, 1998.
2. Stuerzlinger, W., Zaman, L., Pavlovych, A., Oh, J.-Y. (2006). The Design and Realization of CoVID, A System for Collaborative Virtual 3D Design, Virtual Reality, 10(2), 135-147, Oct 2006.