

CHI 2011 – NON-FLAT DISPLAYS | 10.05.2011

AUDIENCE BEHAVIOR AROUND LARGE INTERACTIVE CYLINDRICAL SCREENS



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Flat Screen

Frame



Rectangle



Cylindrical screens

Columns

Classical columns



Digital columns

still bloody
expensive



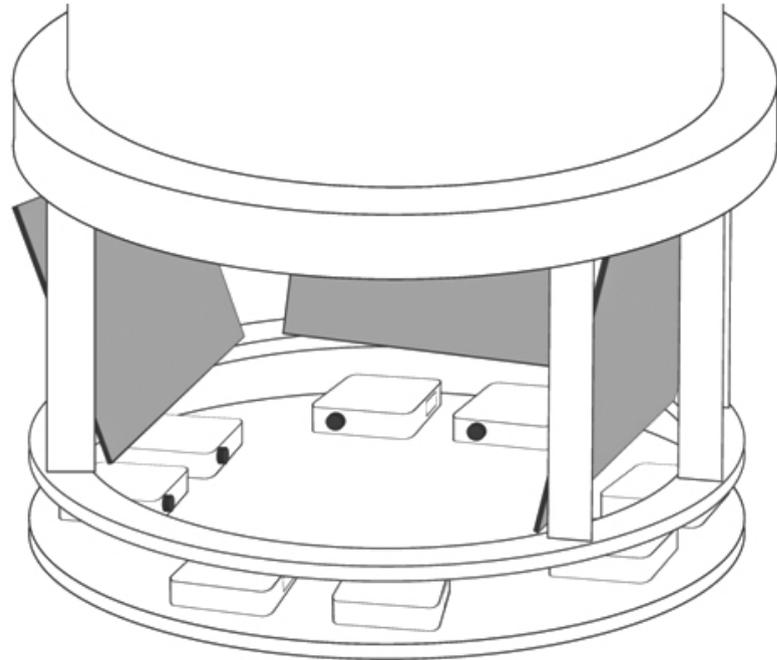
Prototype

interactive
rear-projection
column



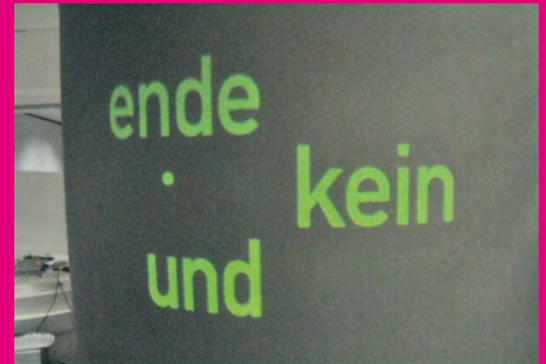
Prototype

interactive
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column



Applications

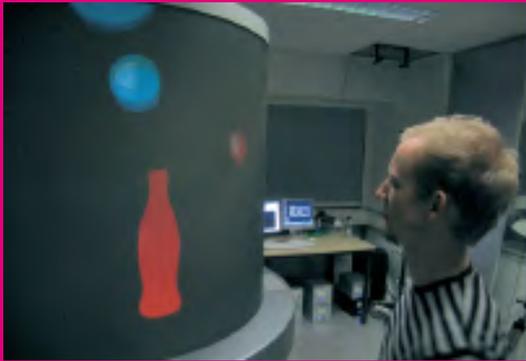
Reactive Typo



Move to Paint



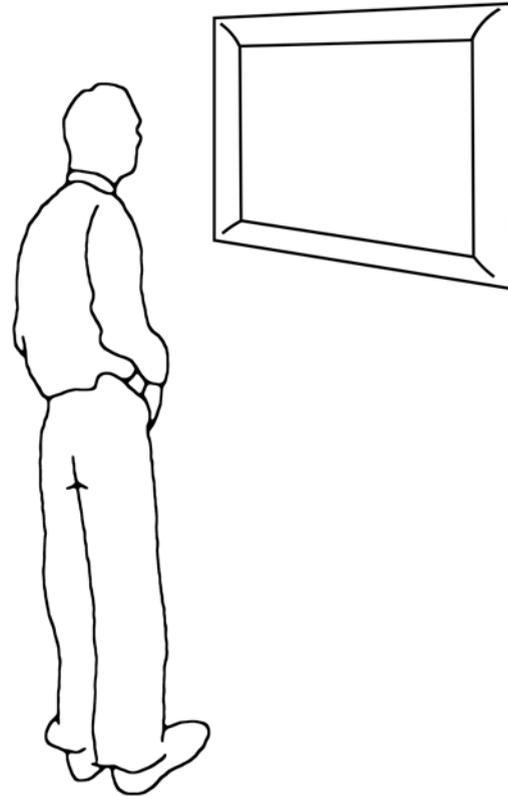
Ambient Column

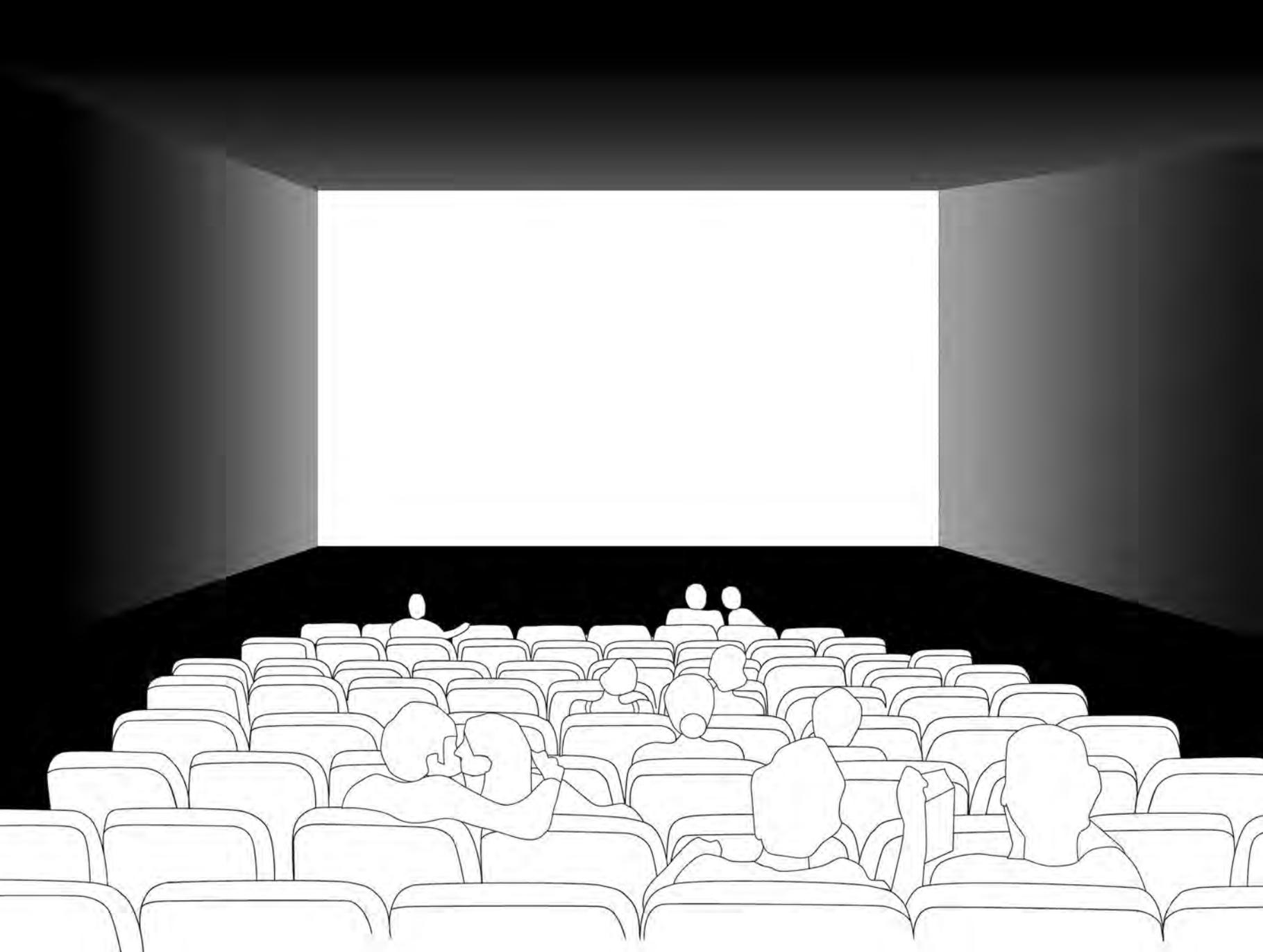


Screen theory

Lev Manovich

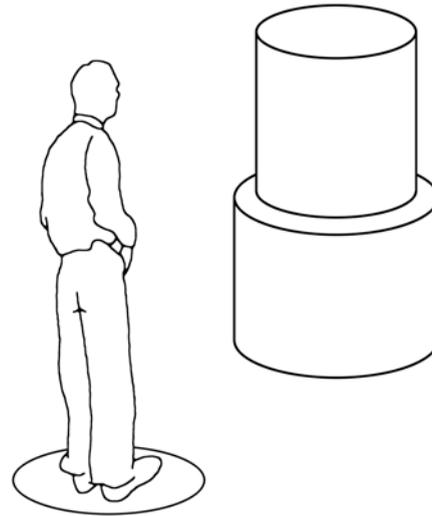
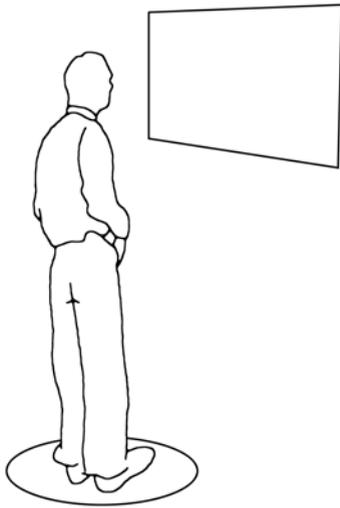
- > Imprisonment of the viewer's body in front of classical screens



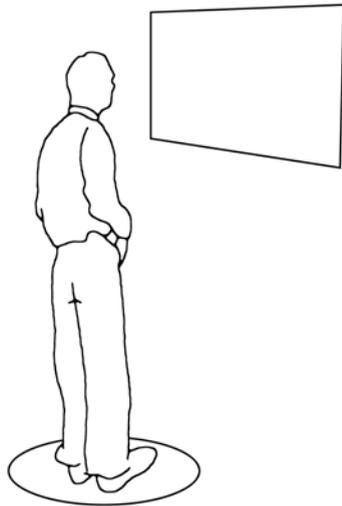


Rectangle

Sweet spot / Prison

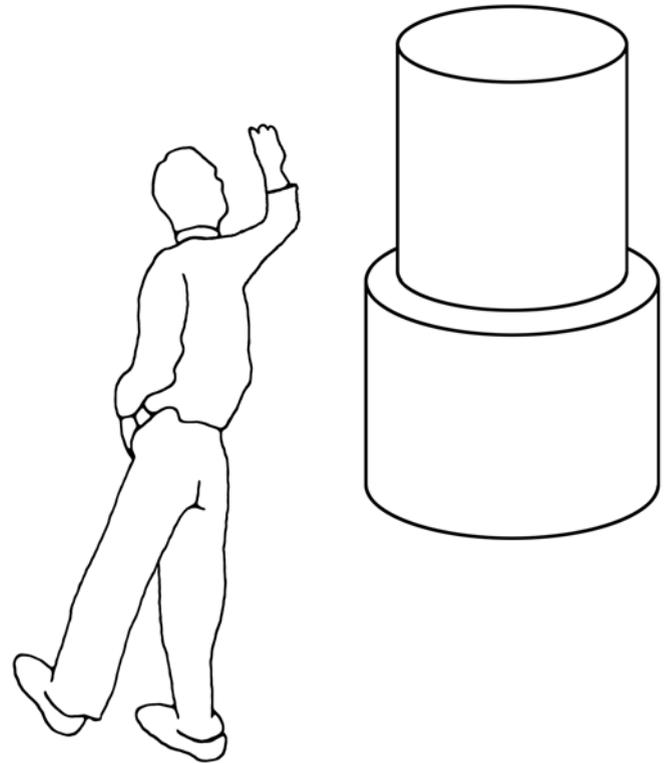


Sweet spot / Prison



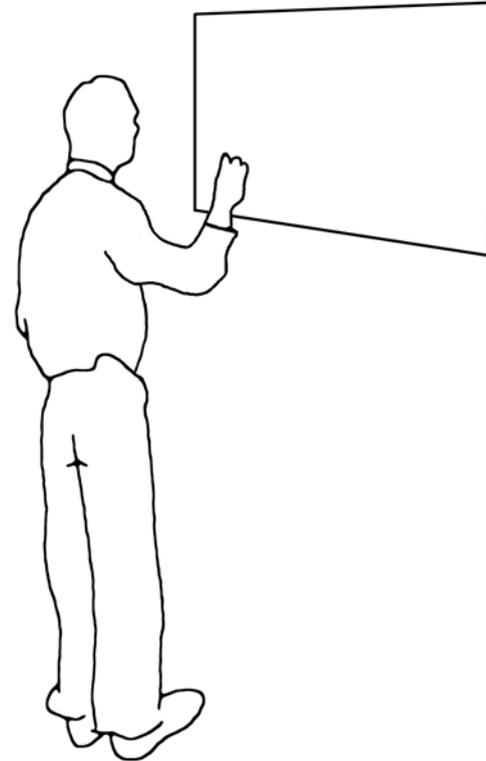
Hypotheses

- > H1: Users walk more when interacting with the column
- > more distance, more time, more positions



Hypotheses

- > H2: Users position themselves frontally with flat screens – not with column screens



User study

User study

- > Lab study, 2 days, 4 prototypes
- > within-subject design
- > Video observation, interviews and questionnaires

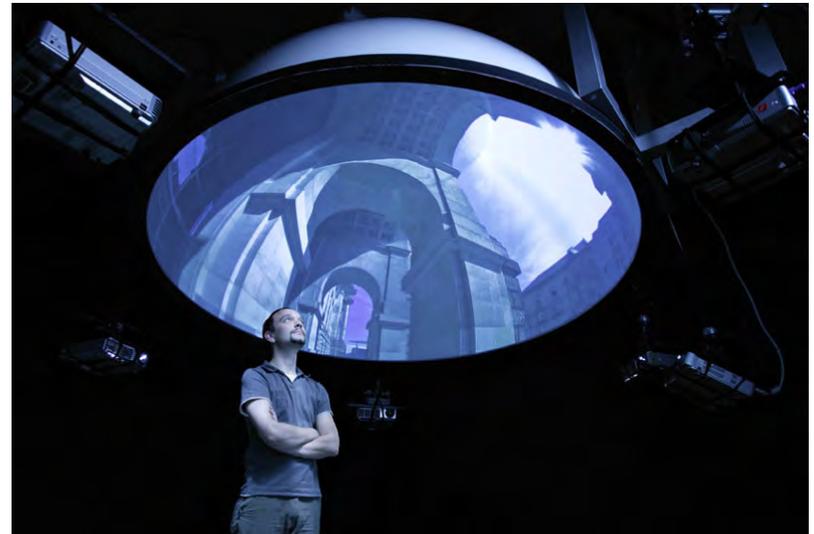


Survey Prototypes

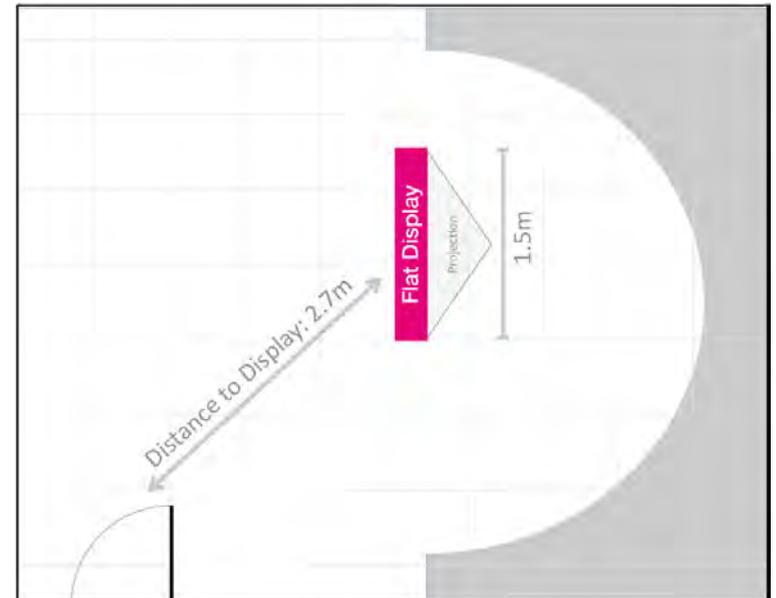
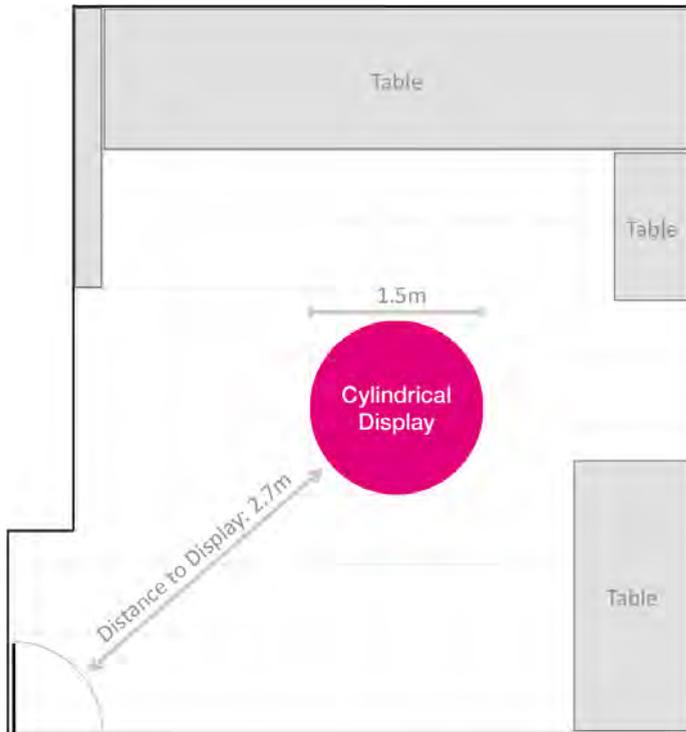


Fake Prototypes

Purpose: to distract from displays under investigation



Room layout



Participants

- > 15 participants, 10 male, 5 female, 32.7 years mean age, diverse demographic backgrounds
- > send them on „screen museum round tour“

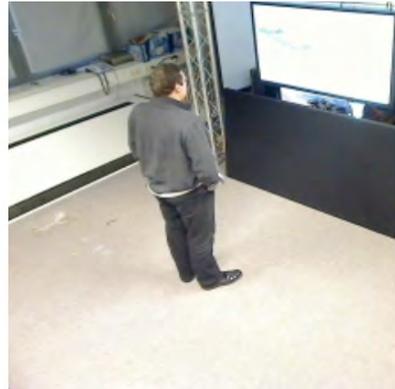


Observation



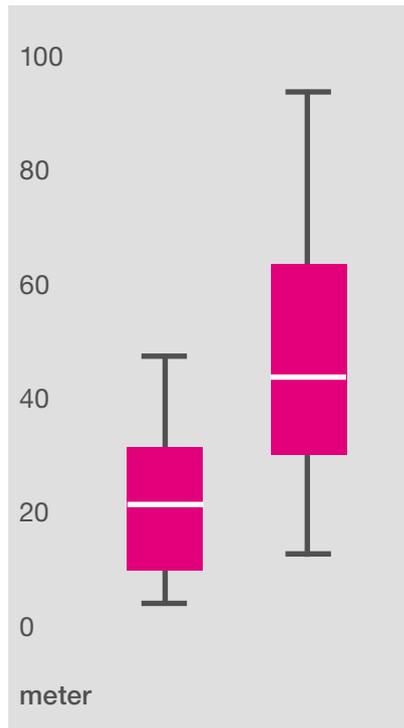
Results

H1: Walking / H2: Frontal Position



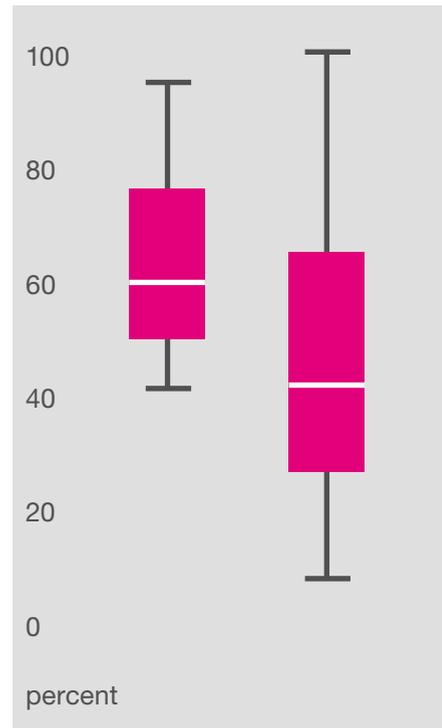
H1: Walking / H2: Frontal Position

H1a: Distance Walked



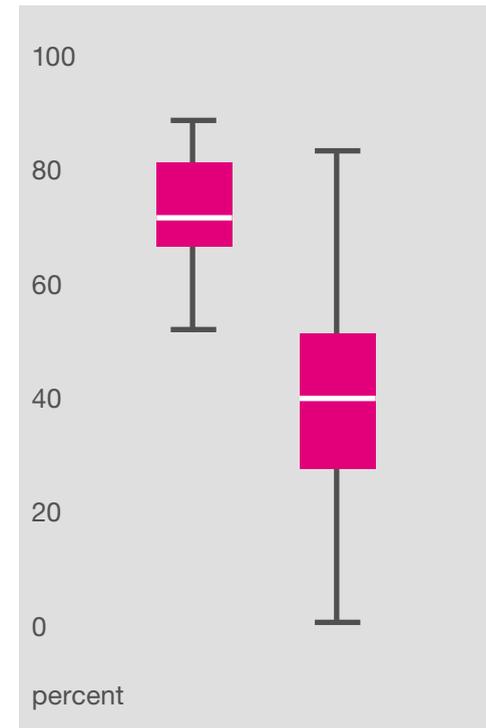
Flat/Column

H1b: Time spent standing



Flat/Column

H2: Parallel shoulder position



Flat/Column

□ mean
■ std

H1: Walking / H2: Frontal Position

Measure	Scale	Column mean	Flat mean	p-Value
Distance walked	meters	47.3	21.2	0.01
Time spent standing	percent	44.9	62.8	0.05
Mean duration of stops	seconds	3.5	9.9	0.01
Max duration of stops	seconds	12.9	38.7	0.05
Total time spent	seconds	97.7	172.8	0.01
Time spent with shoulders parallel	percent	41.5	69.5	0.001
Time spent with shoulders parallel while walking	percent	22.1	46.3	0.001
Time spent with shoulders parallel while standing	percent	70	82	0.001
Stops per minute	1/min	8.3	6.8	
Mean distance from display	meters	1.5	1.7	
Variance in location	rows	5.6	2.3	0.001
Variance in location	columns	3.7	0.93	0.001

All comparisons with Wilcoxon-signed-rank-test with paired samples.

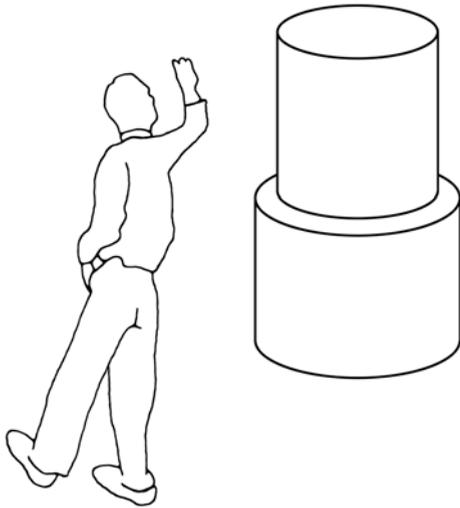
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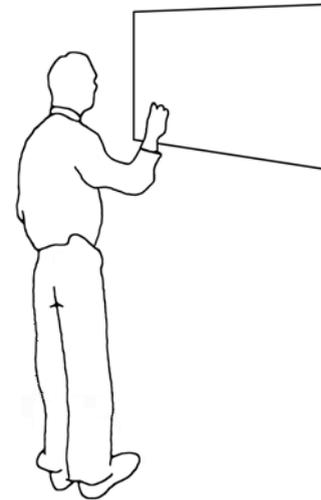
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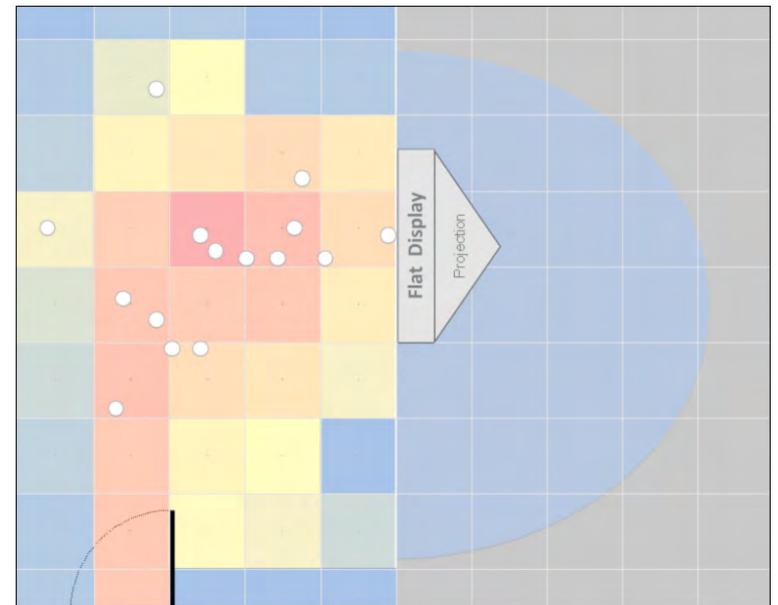
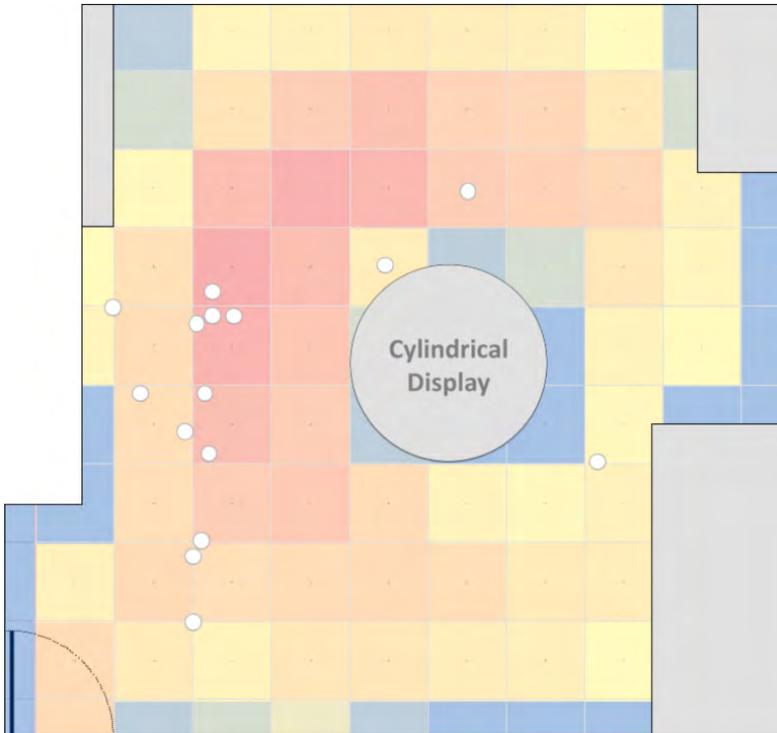
H1: walking, position variance
>> supported



H2: frontal positioning
>> partially supported



Sweet spot / Prison



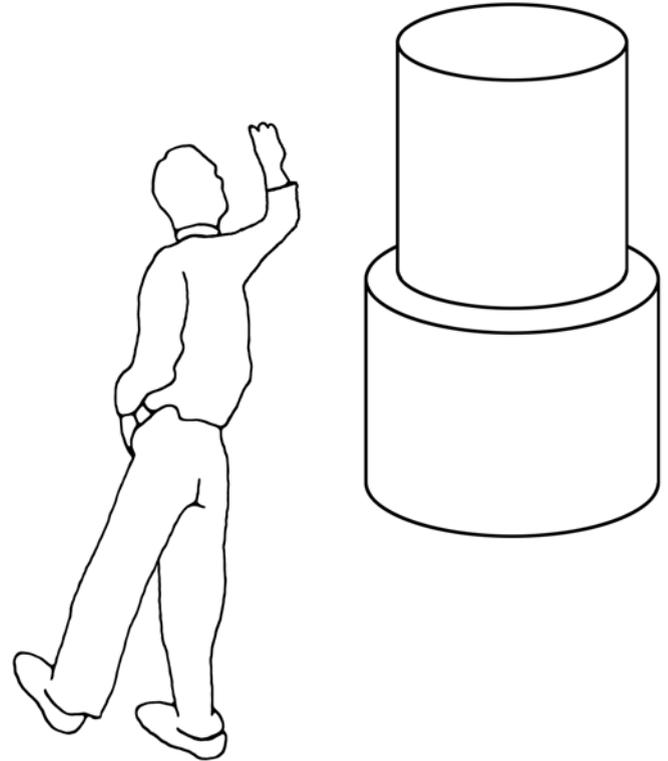
Interpretation

Flat Screen: Imprisonment

Column:
Breaks the Prison

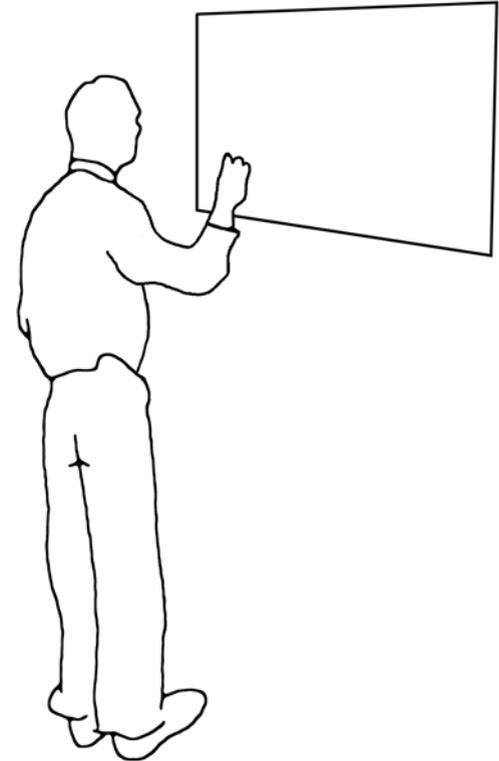
Columns

- > are encountered laterally.
Design for one-hand use.
- > are for passers-by.
Design for walking.
- > are only semi-framed.
Design for variable positions.



Flat screens

- > are faced frontally.
Design for both-hand use.
- > are for standing still at a fixed spot for longer times.
More complexity is possible.



Next Step

Next Step: Multiple users

- > Planned study on social interaction around columns
- > No sweet spot: are there less inhibitions to start performing?



Discussion

Discussion & Questions

