



**Maurice  
Ten Koppel**



**Gilles  
Bailly**



**Jörg  
Müller**



**Robert  
Walter**



# Chained Displays

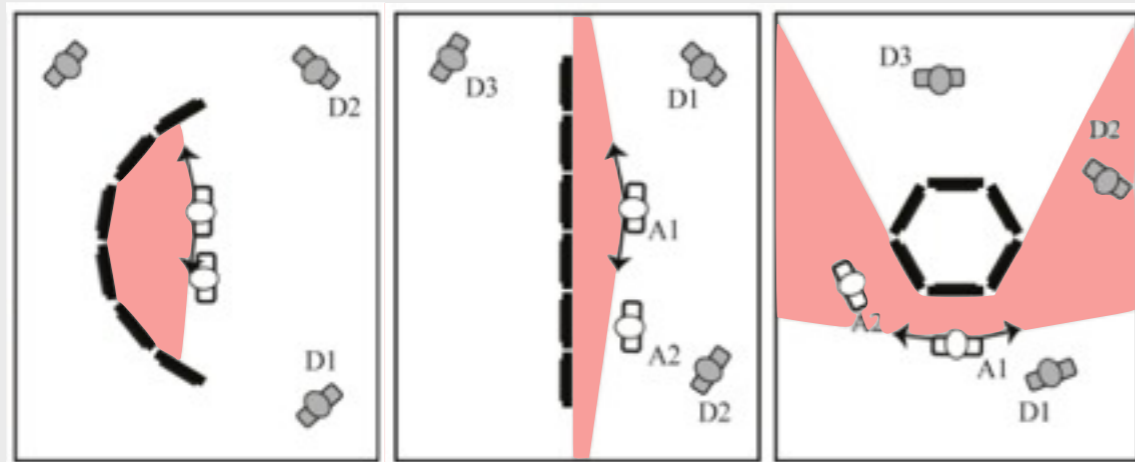
# Research Question

*How can the form factors of Public Displays influence people's behavior?*

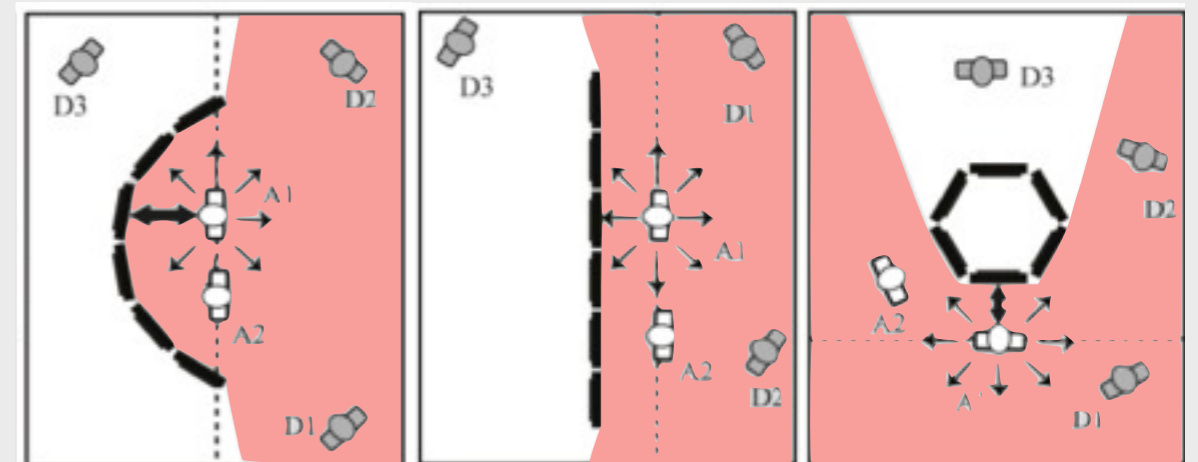


**Flat**

# Design Space: Nimbus & Focus



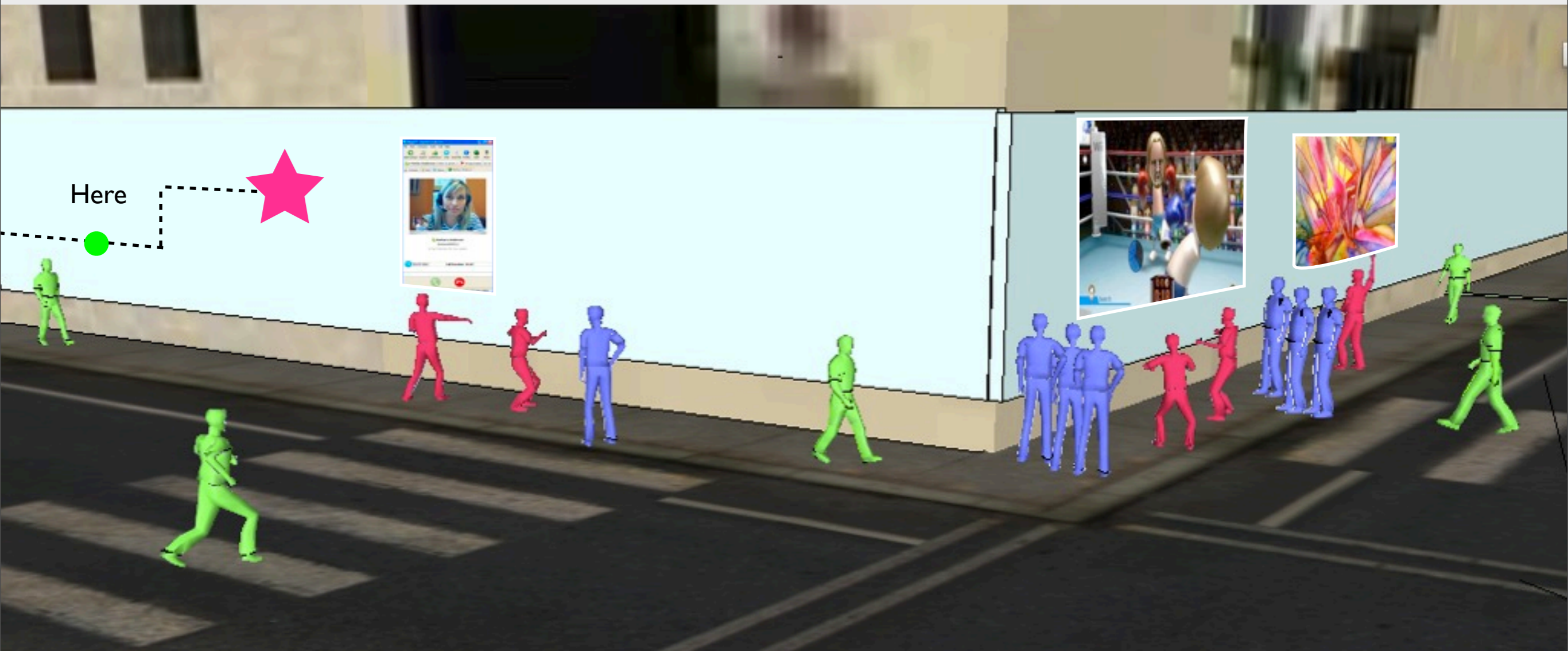
Actor Focus



Actor Nimbus

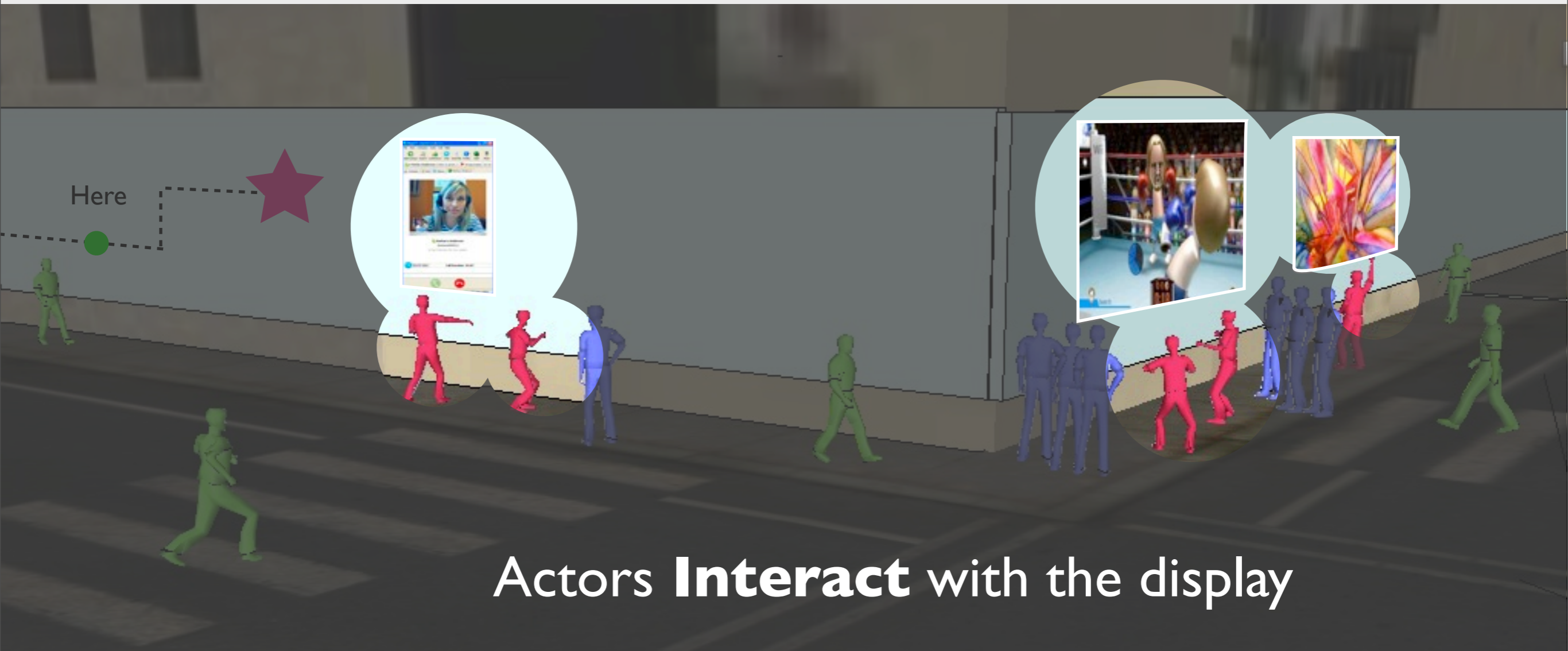
# Motivations

# Public Displays

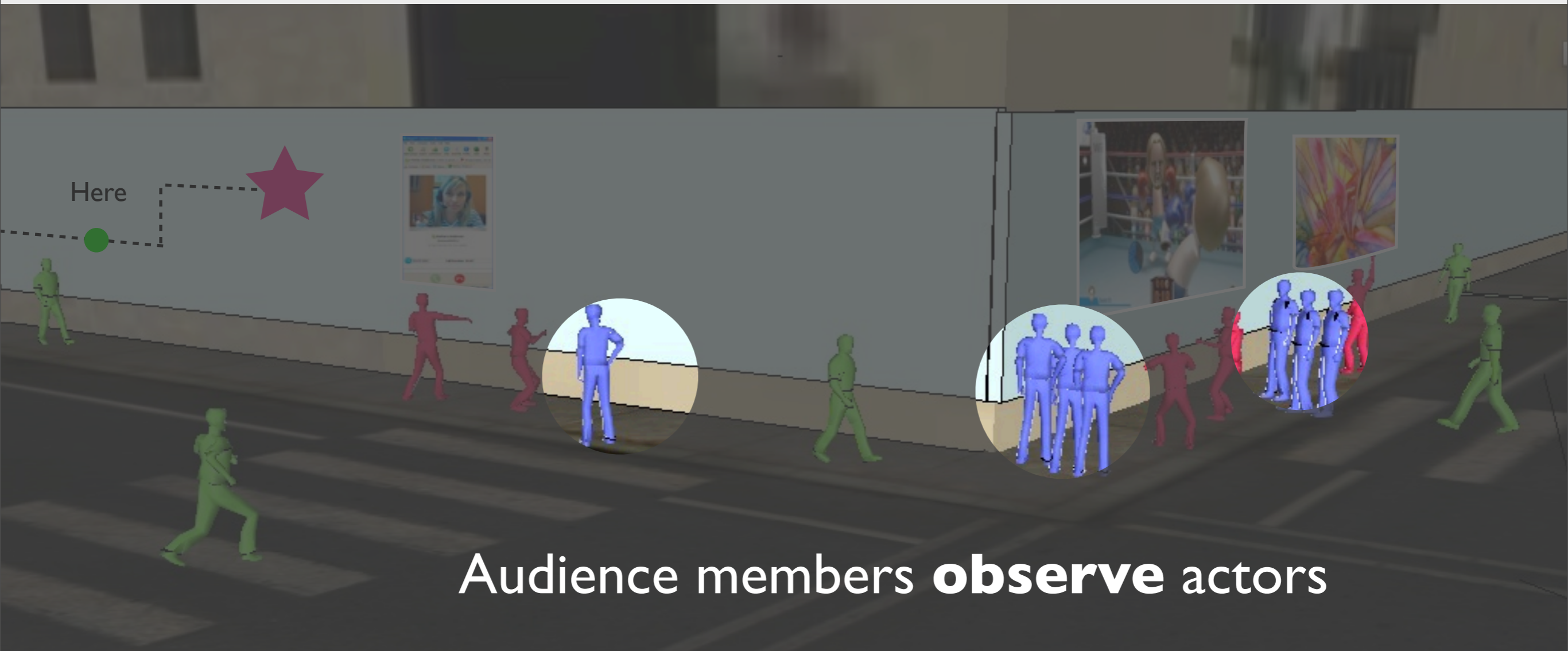


Interactive screens in a public space

# Public Displays

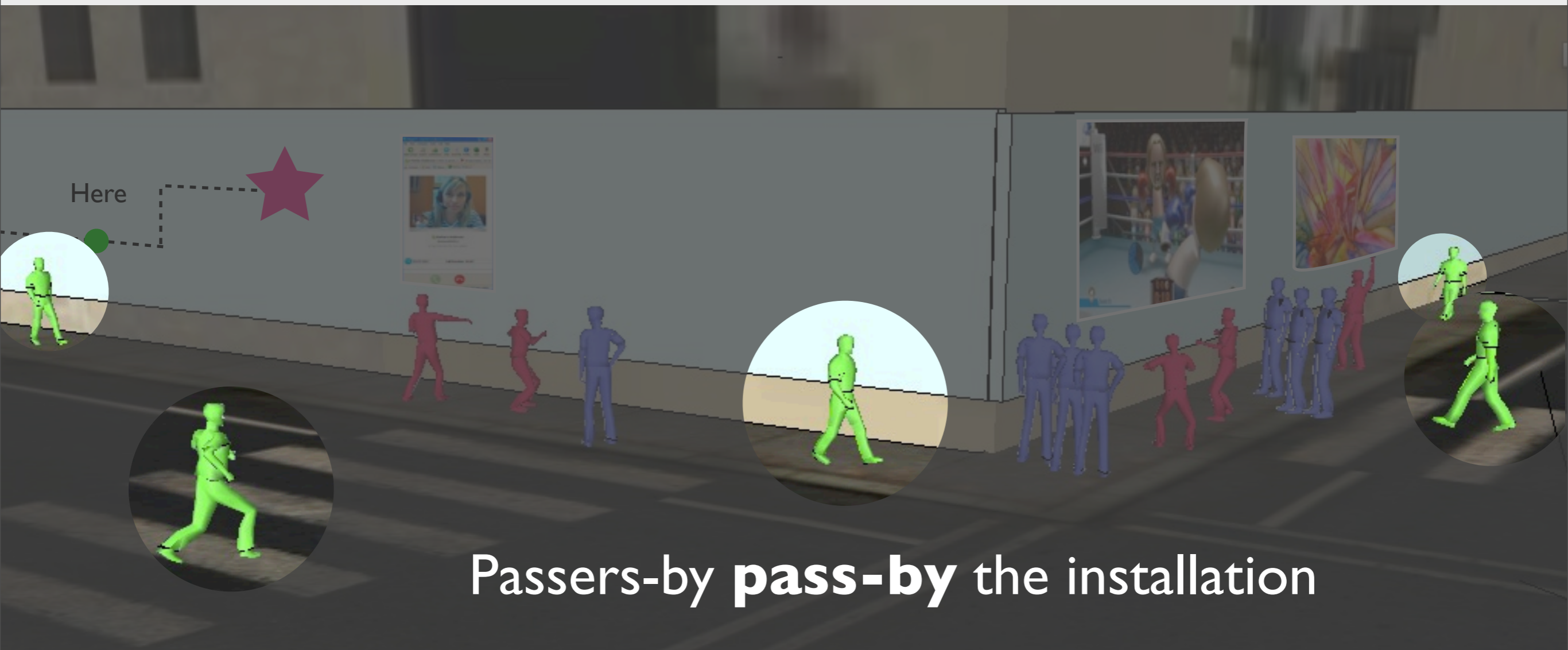


# Public Displays

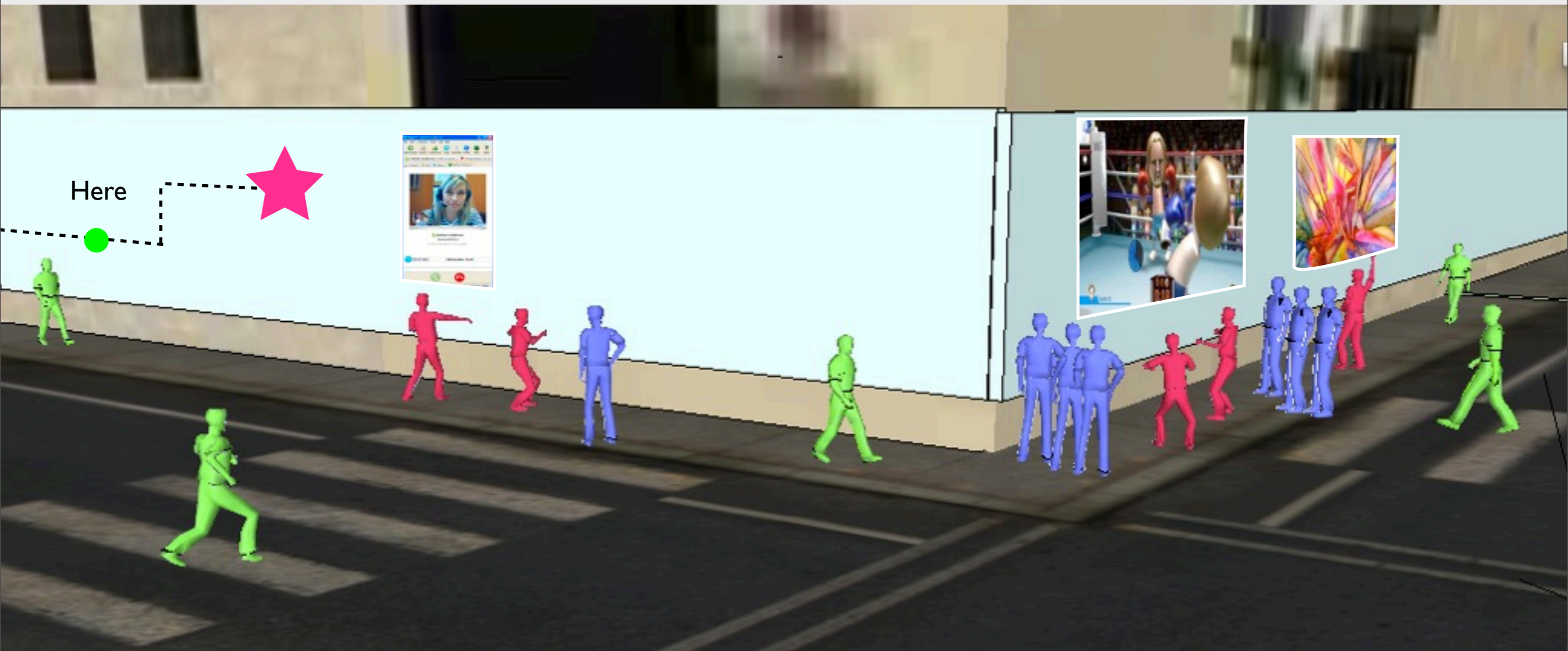




# Public Displays



# Public Displays





City Wall

## Flat Public Displays

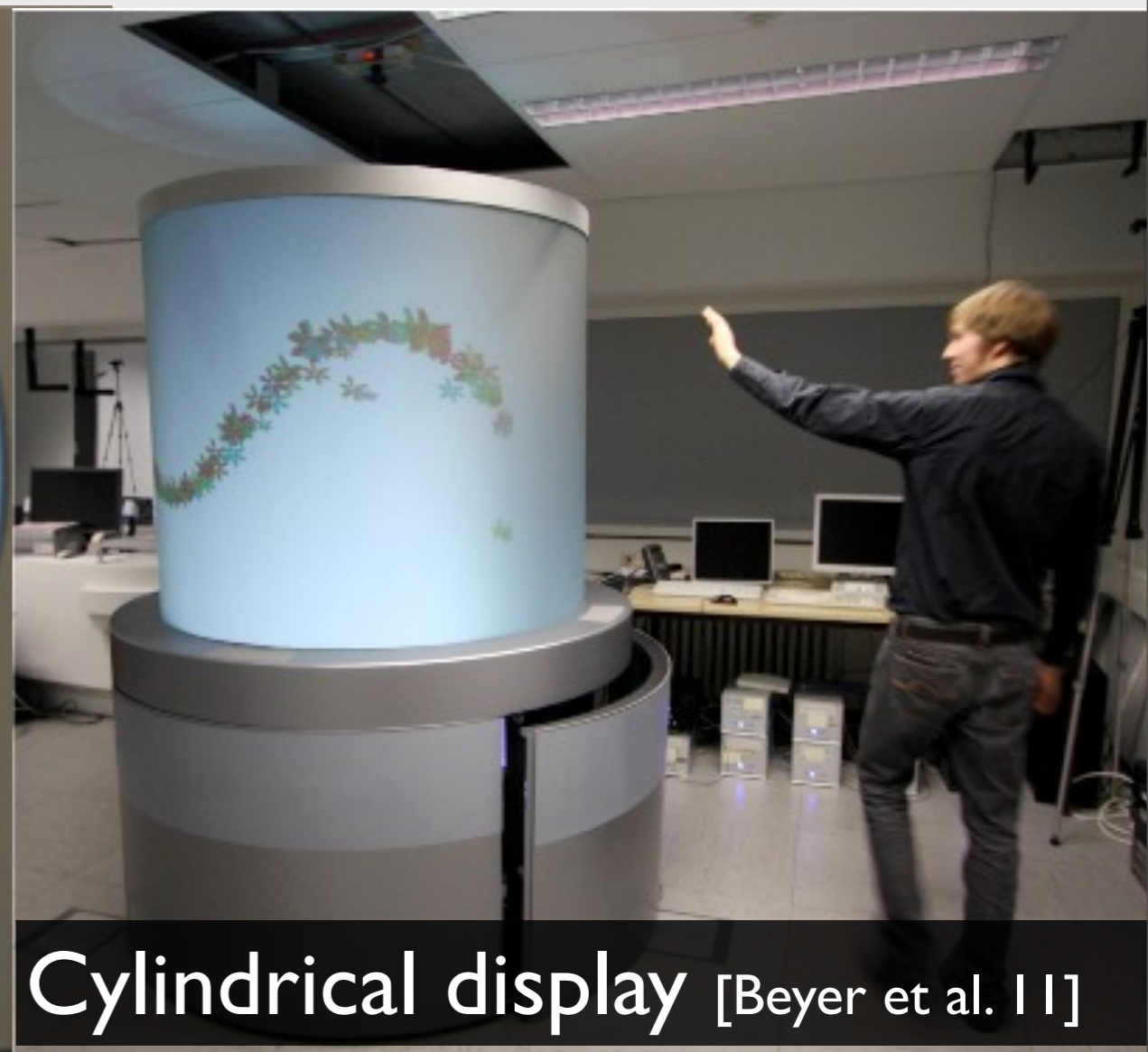


City Wall 2

# **Non-Flat** Public Displays?



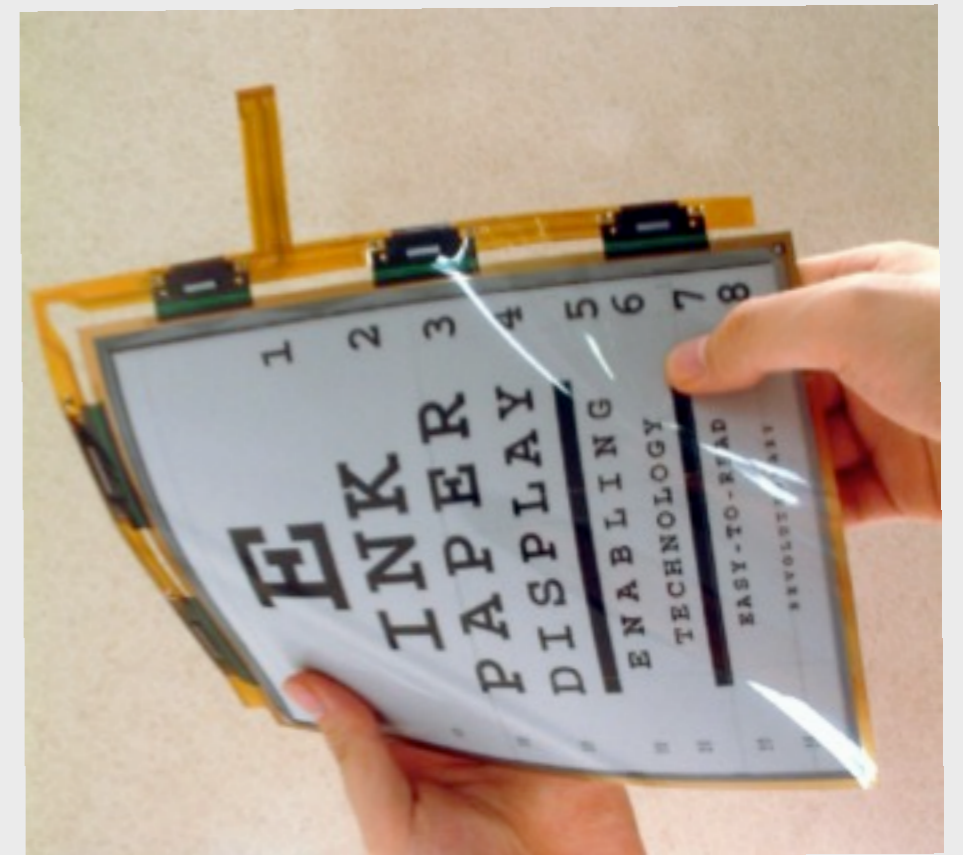
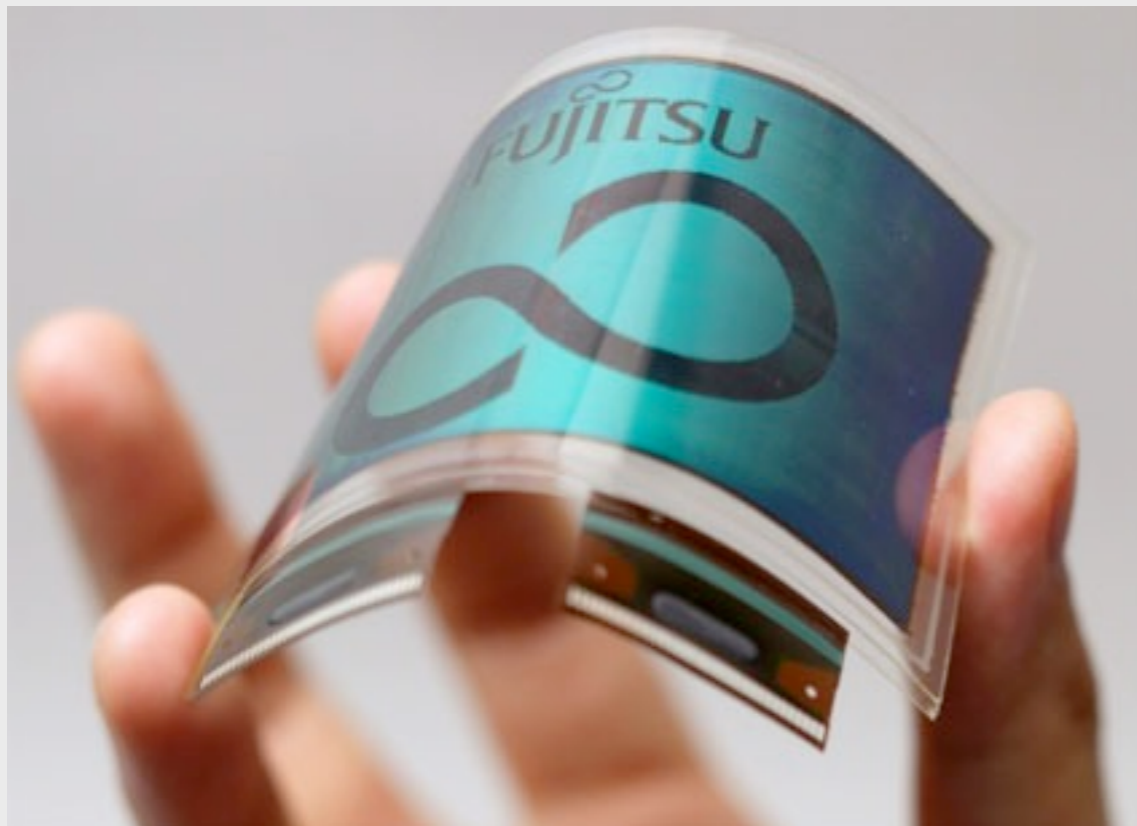
**Sphere** [Benko et al. 08]



**Cylindrical display** [Beyer et al. 11]



Open the way to a large variety of novel **Form Factors**



# Research Question

*How can the form factors of Public Displays influence actors, audience members and passers-by behavior?*



Chained Display

Field Study

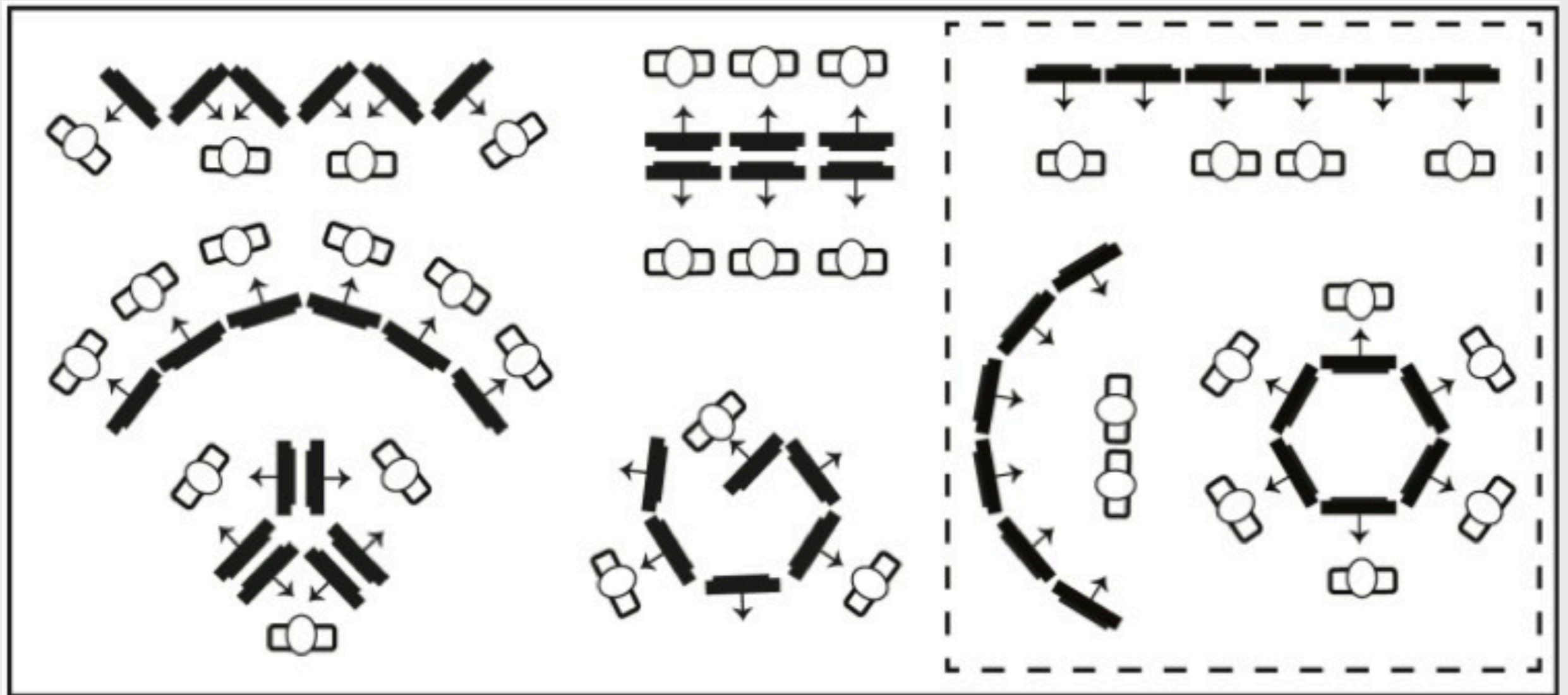
Design Space



System for Creating  
Large **Non-Flat** Public Displays

**Chained Displays**

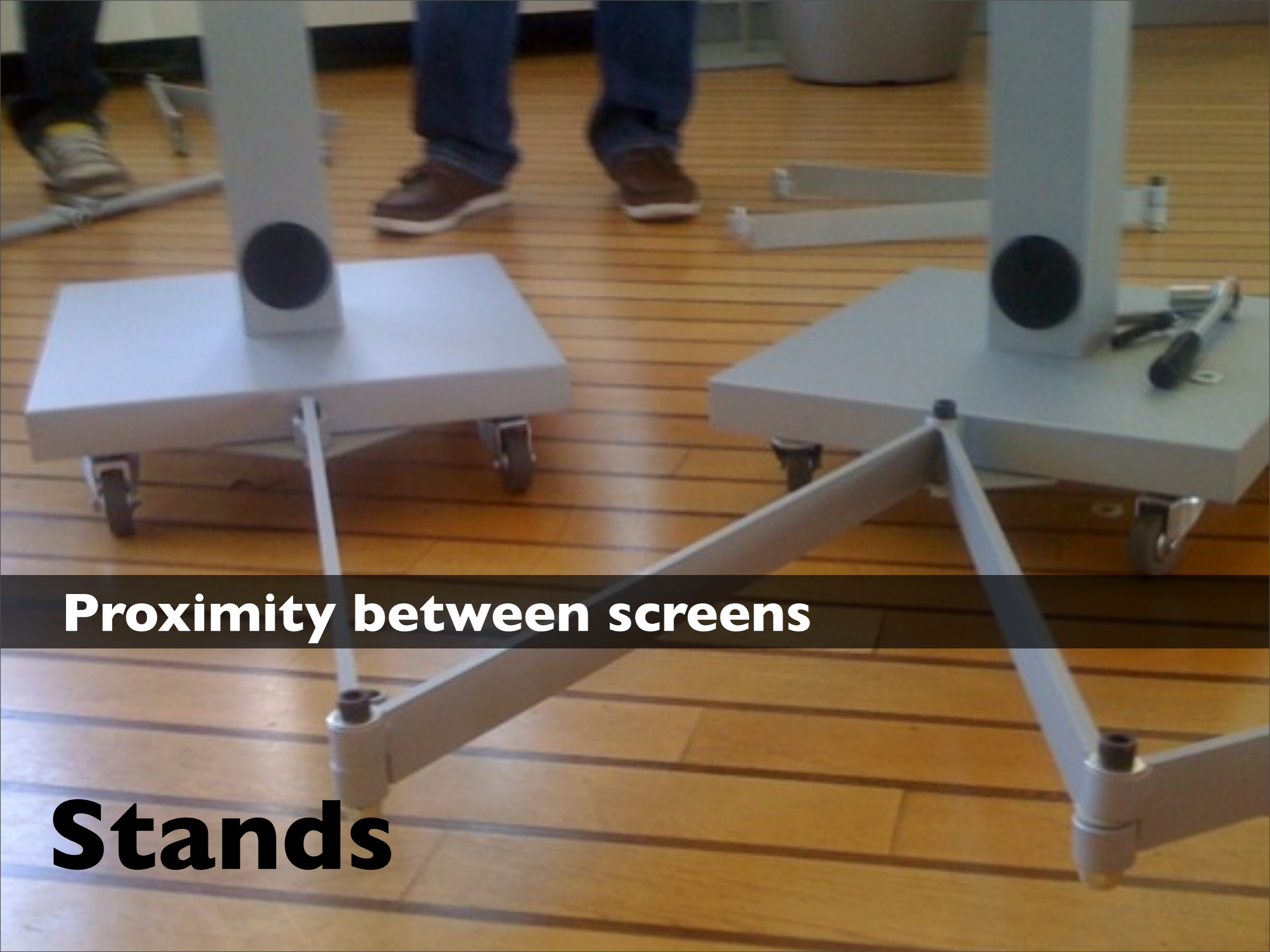
# Chained Displays





**6 screens**

**Configuration**



**Proximity between screens**

**Stands**



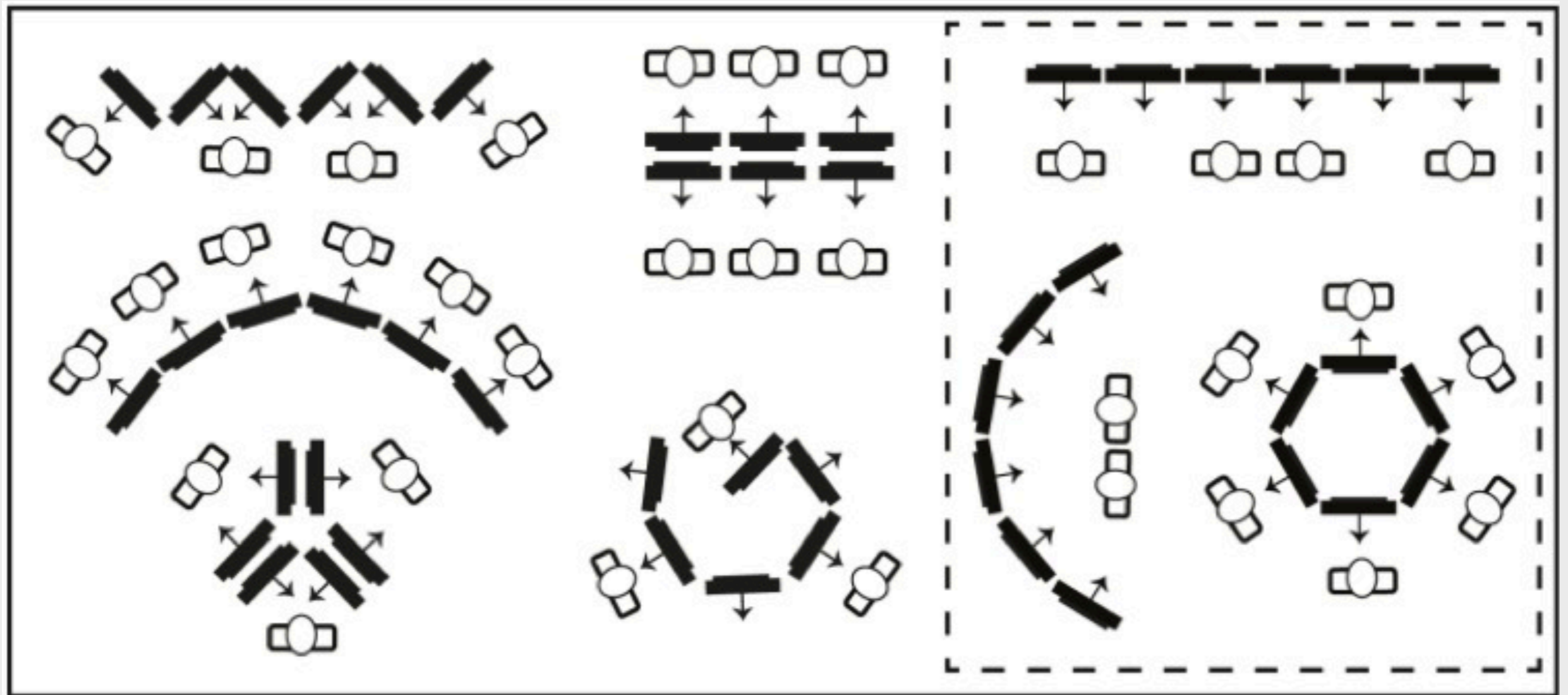
**Body Gesture**



**Interactivity**



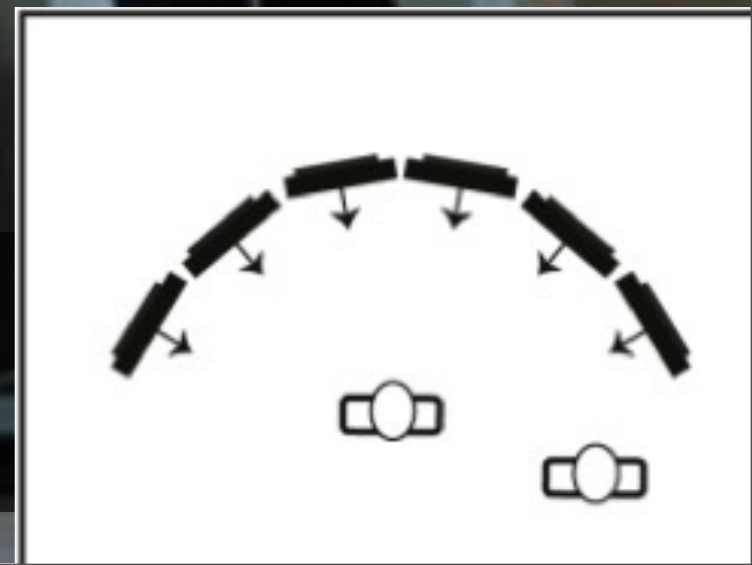
# Chained Displays



# Impact of **Curvature**



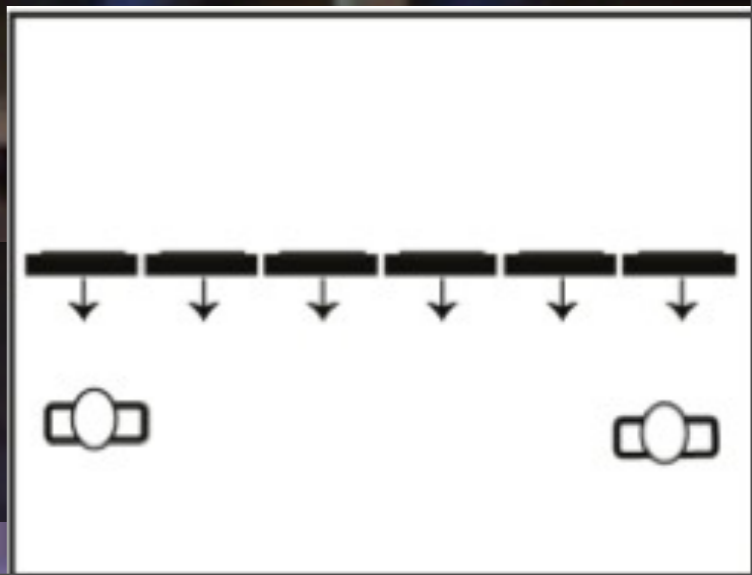
**Concave**

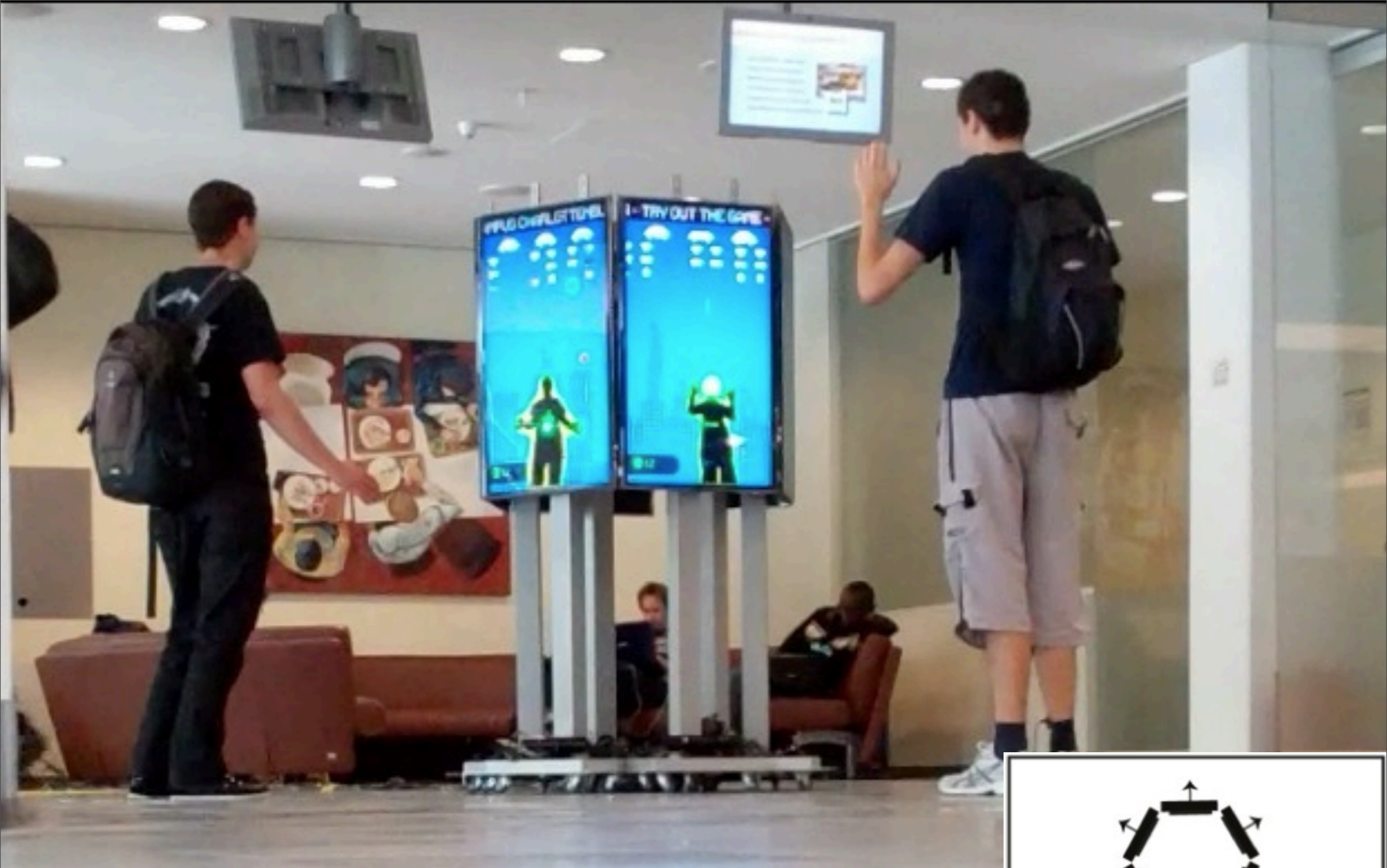




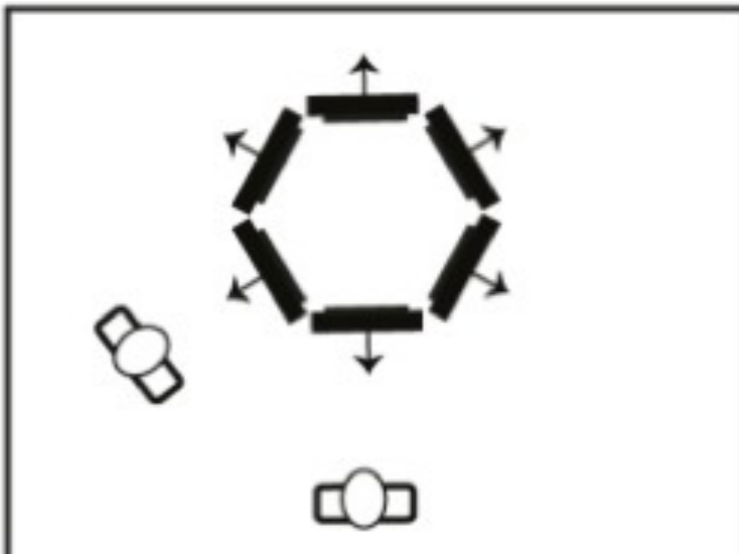


**Flat**





**Convex (Hexagonal)**

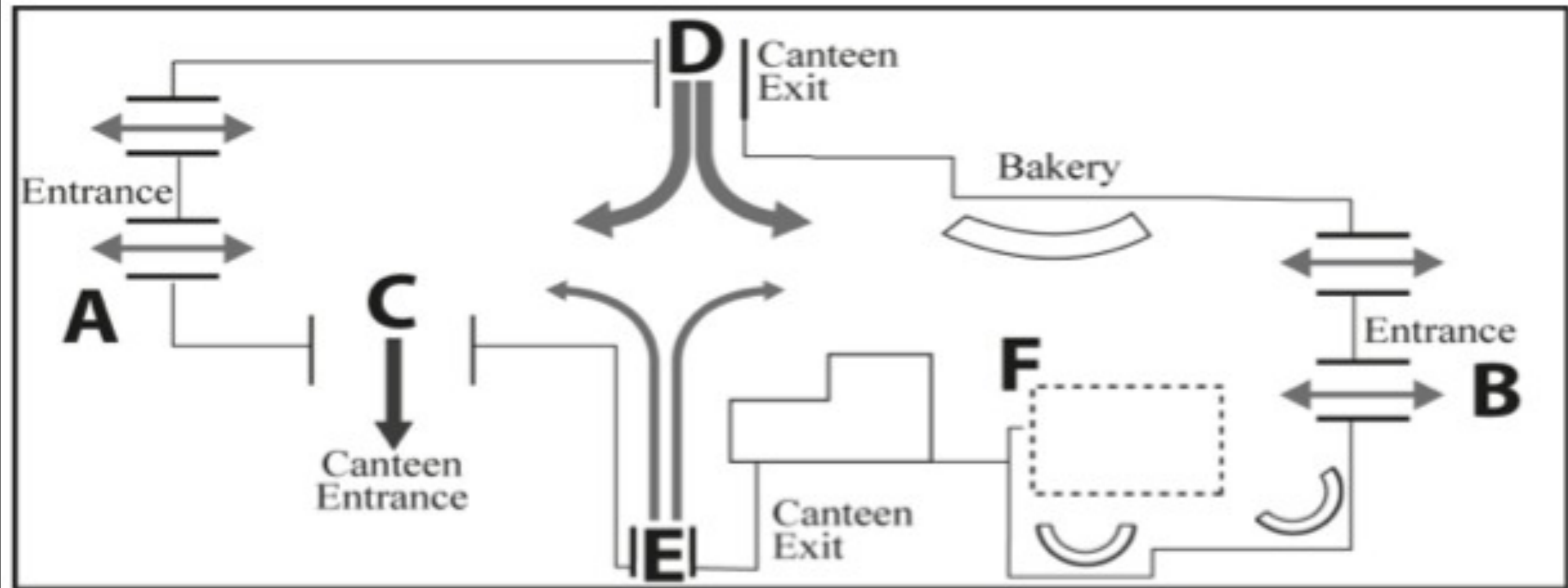


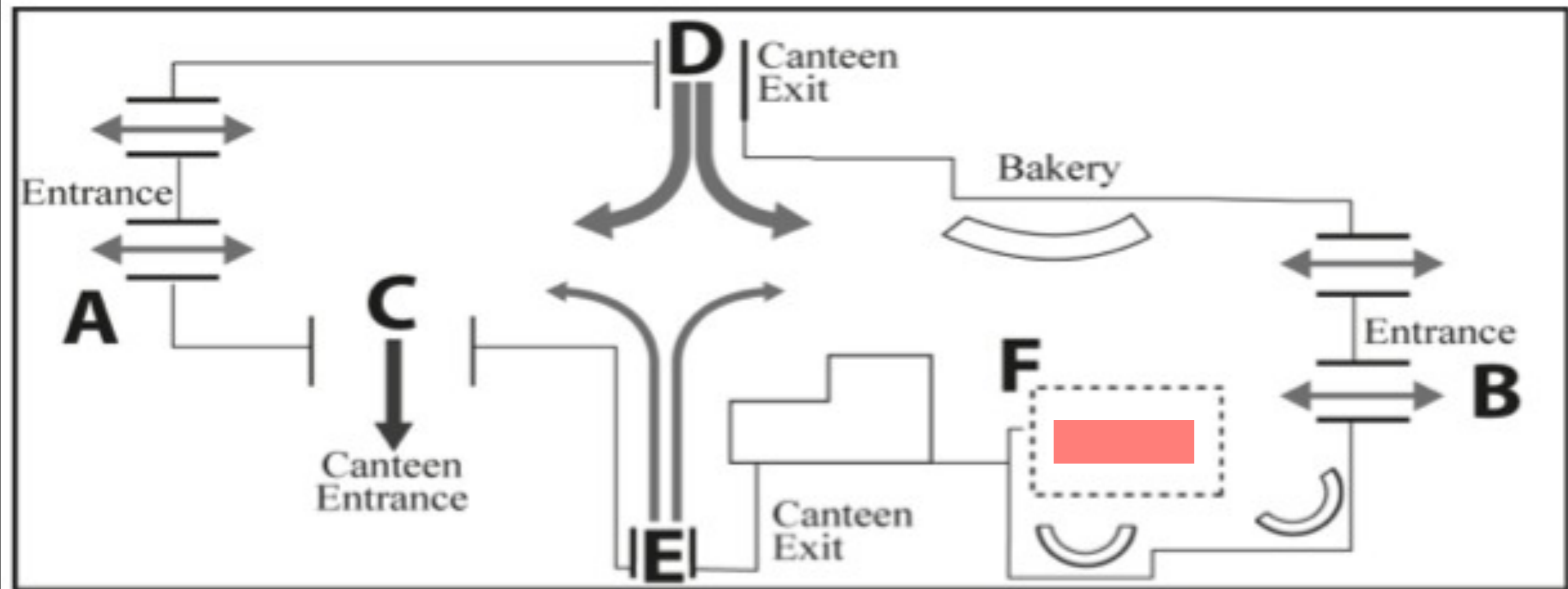
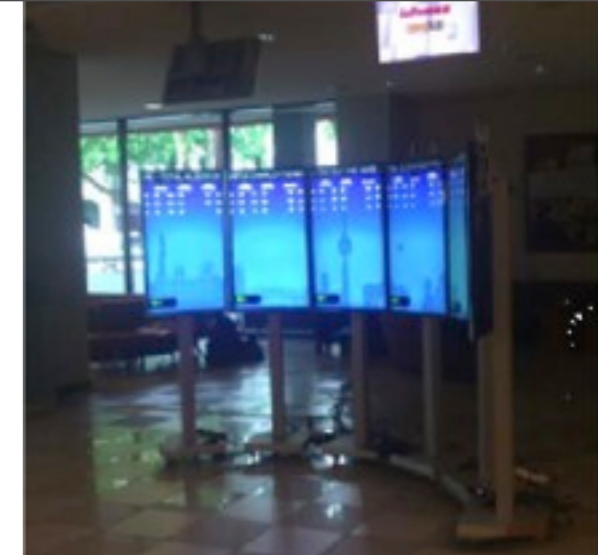
*Chained Display*

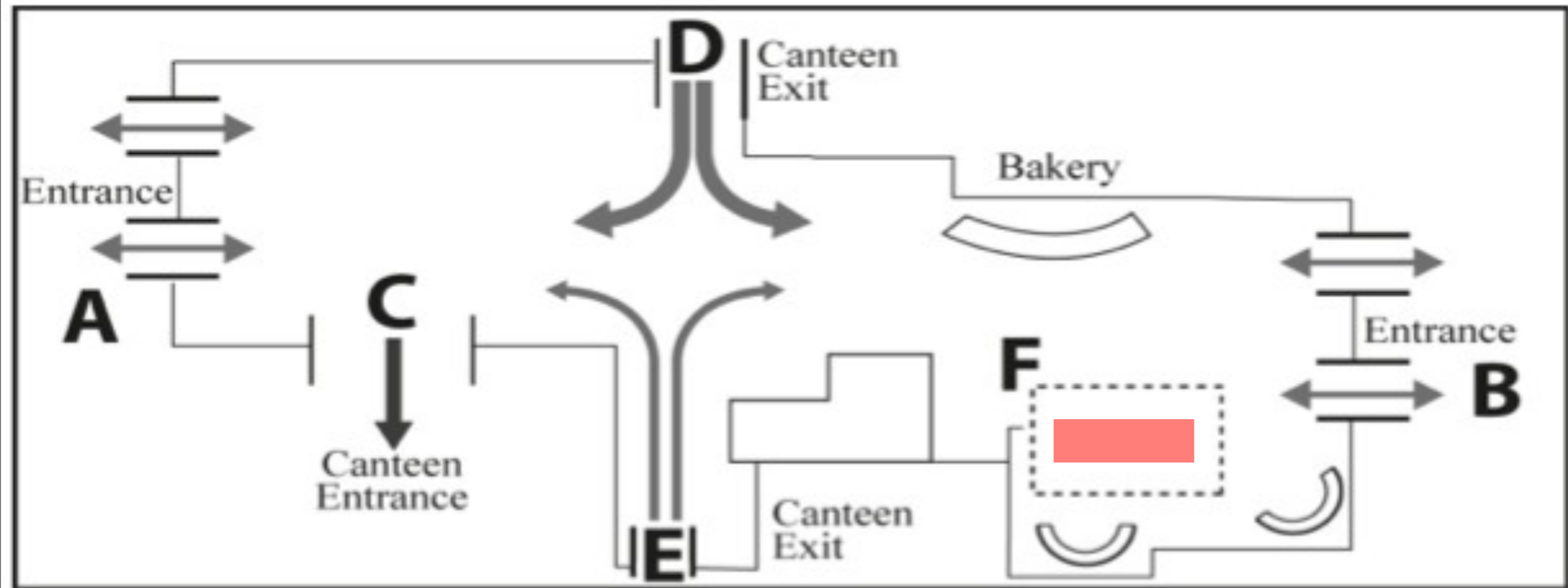
**Field Study**

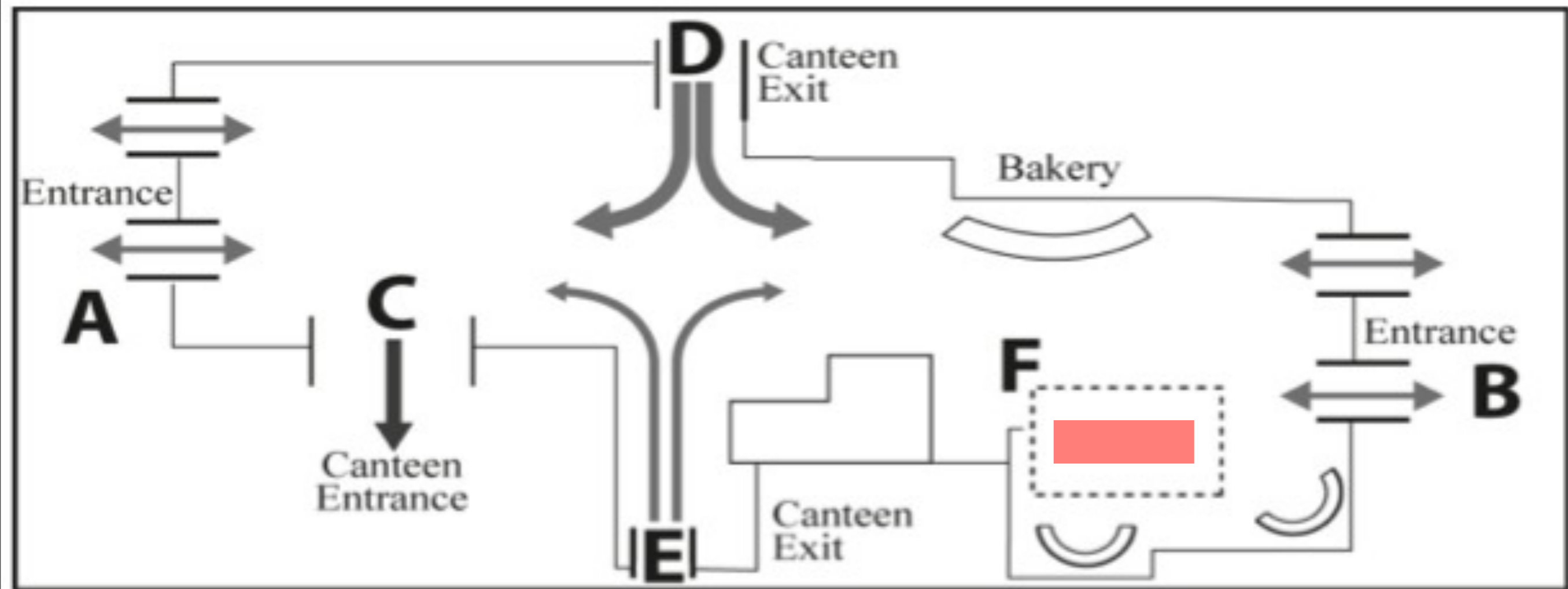
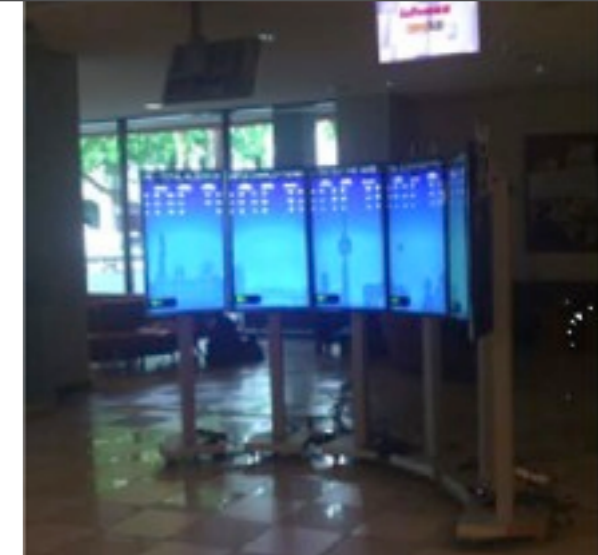
**Design Space**

# Field Study











THE GAME - TOTAL AL



IS CHARLOTTENBURG -



ENS DESTROYED: 105 -





E GREVE - TOTAL ALIEN

DESTROYED: 68 - CAMP

shop

Interactive screen showing a grid of icons at the top, a central image of a person, and a green bar at the bottom with the number 60.

Interactive screen showing a grid of icons at the top, a large blue area in the middle, and a grid of icons at the bottom.

# Findings

**Approaching**



Individual Approaching (Audience member)



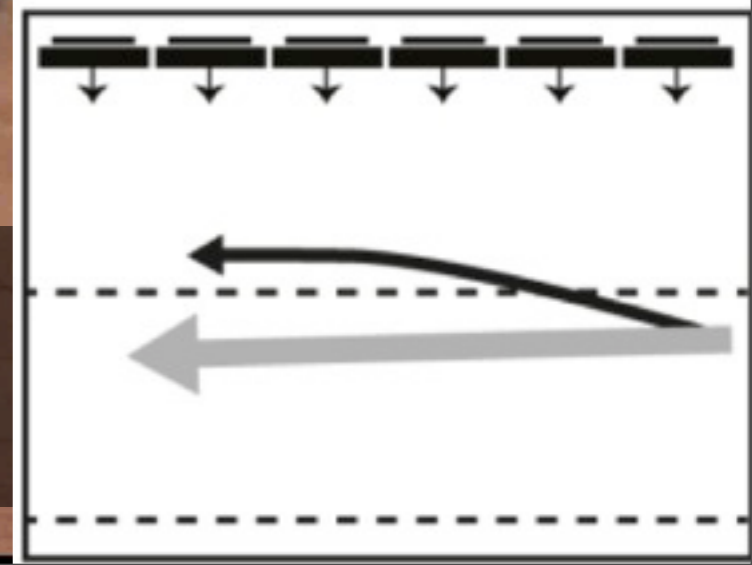
Individual Approaching (Audience member)

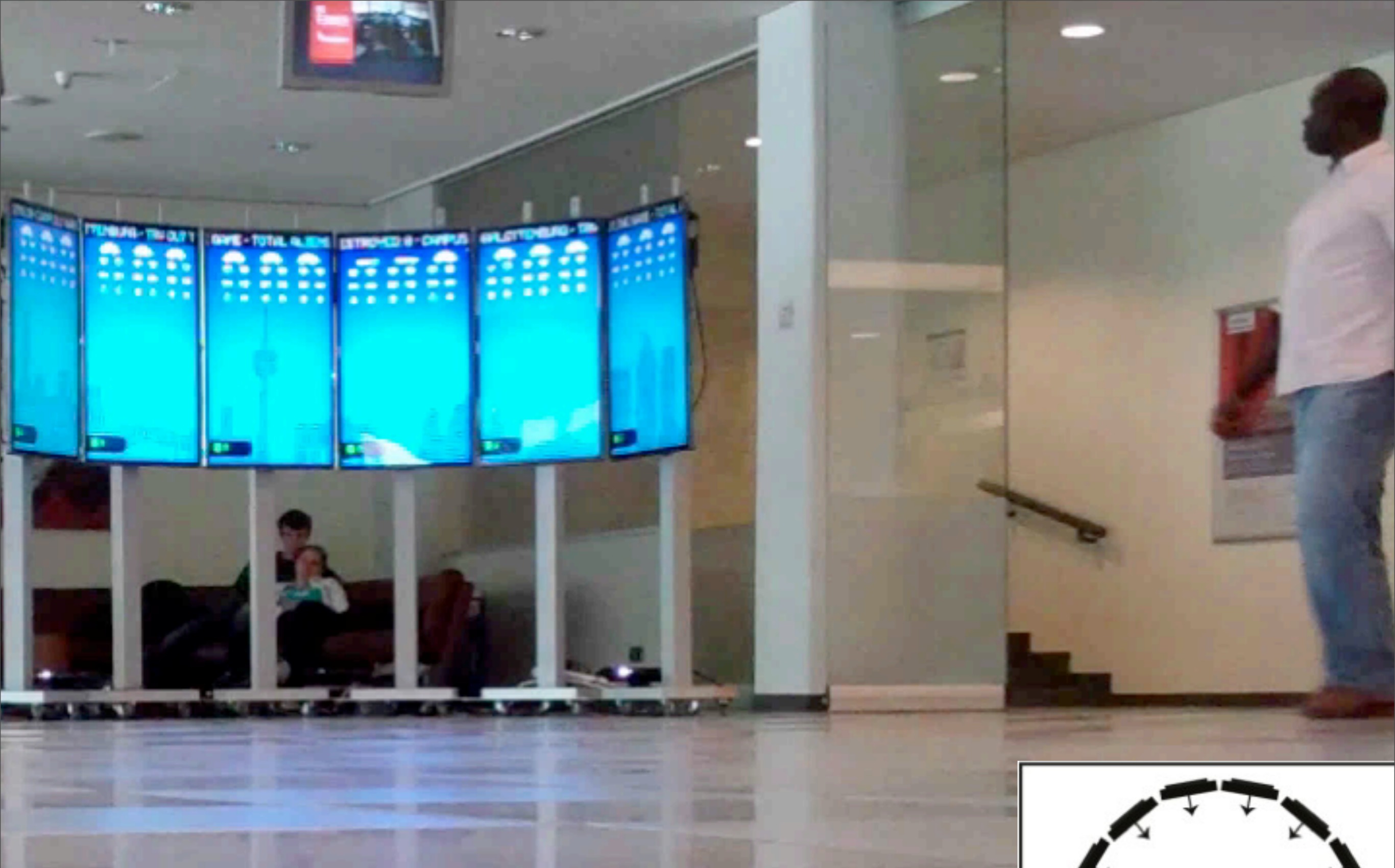


infomax  
TRX

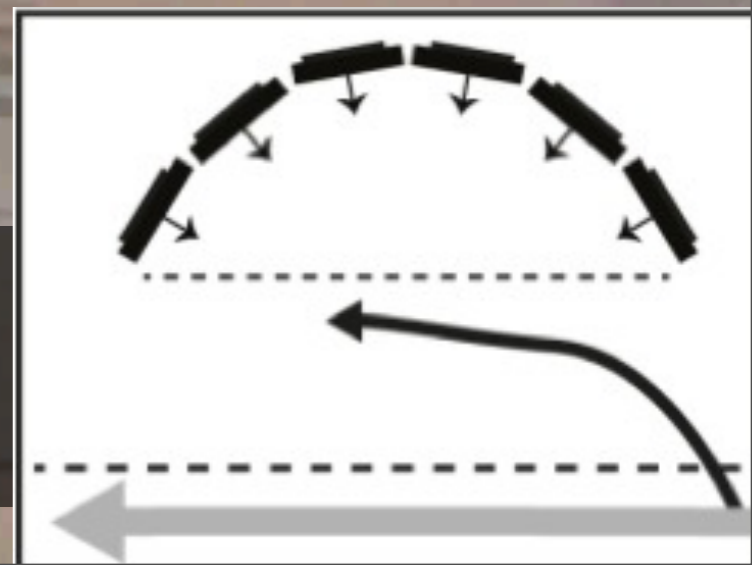
...TRY OUT THE GAME  
...TRY OUT THE GAME - TI  
...AL ALIENS DESTROYE  
...CHIPPUS CHIFFLOTTE

# Individual Approaching (Passer-by)

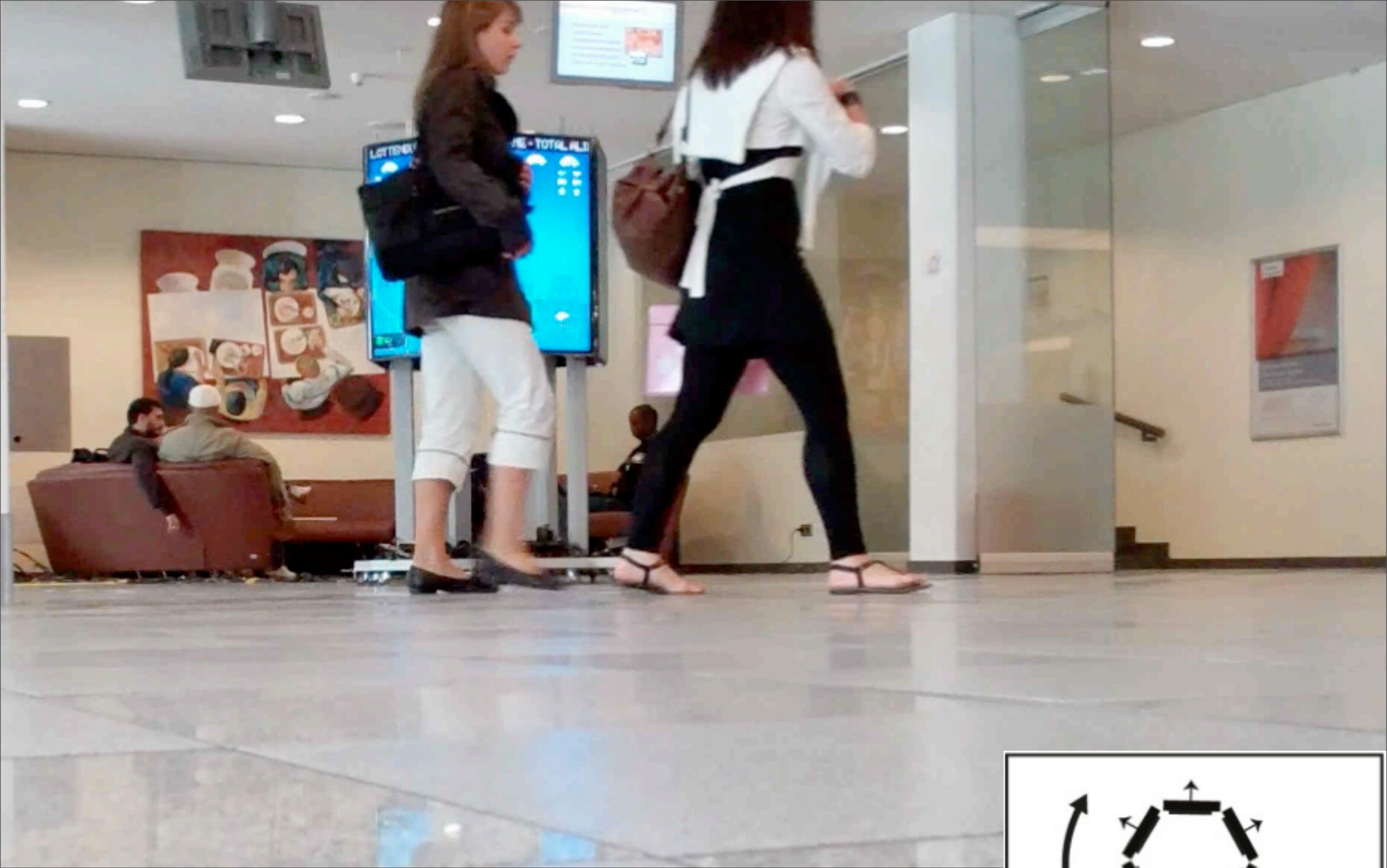




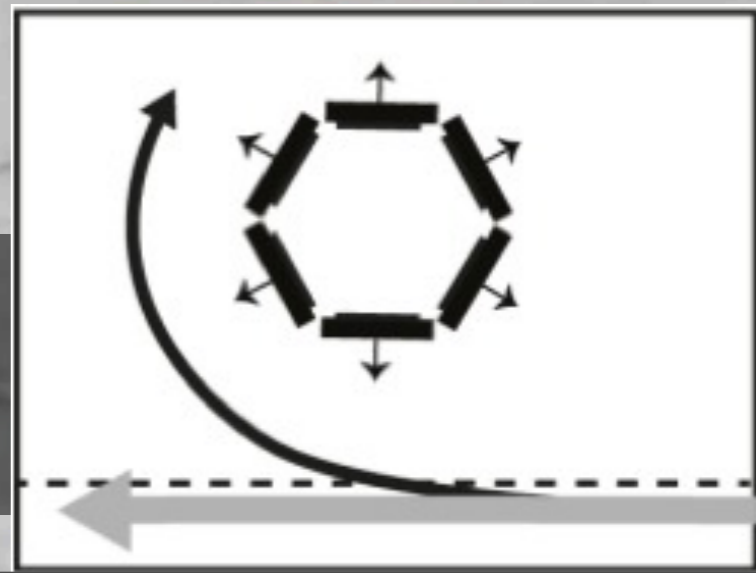
# Individual Approaching (Passer-by)



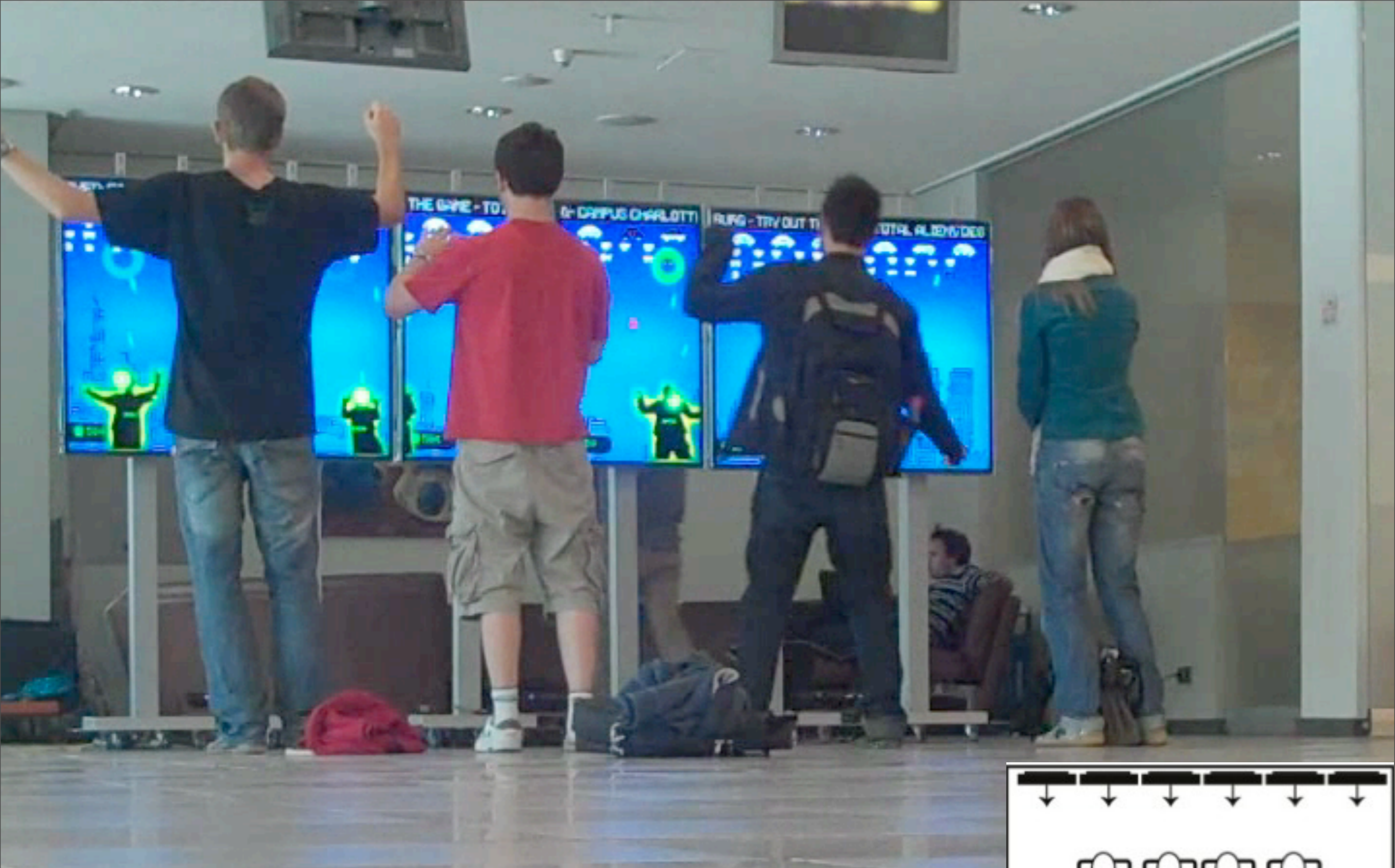




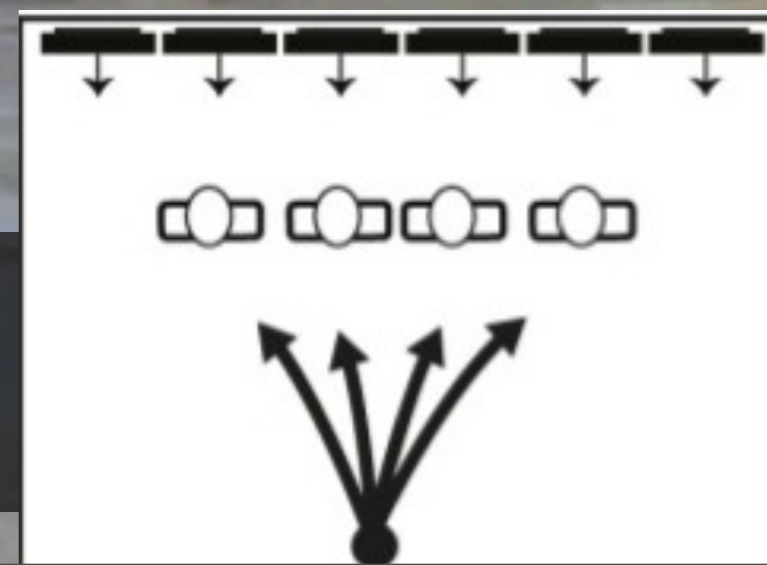
# Individual Approaching (Passer-by)



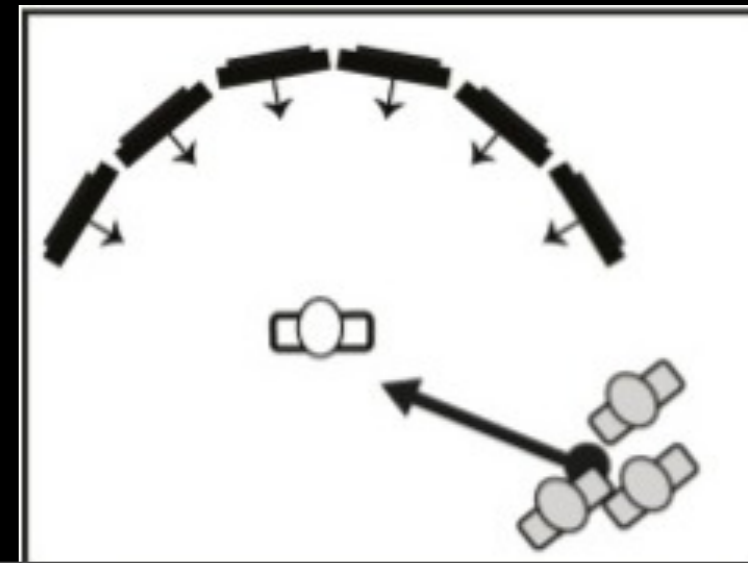
# **Group Approaching**

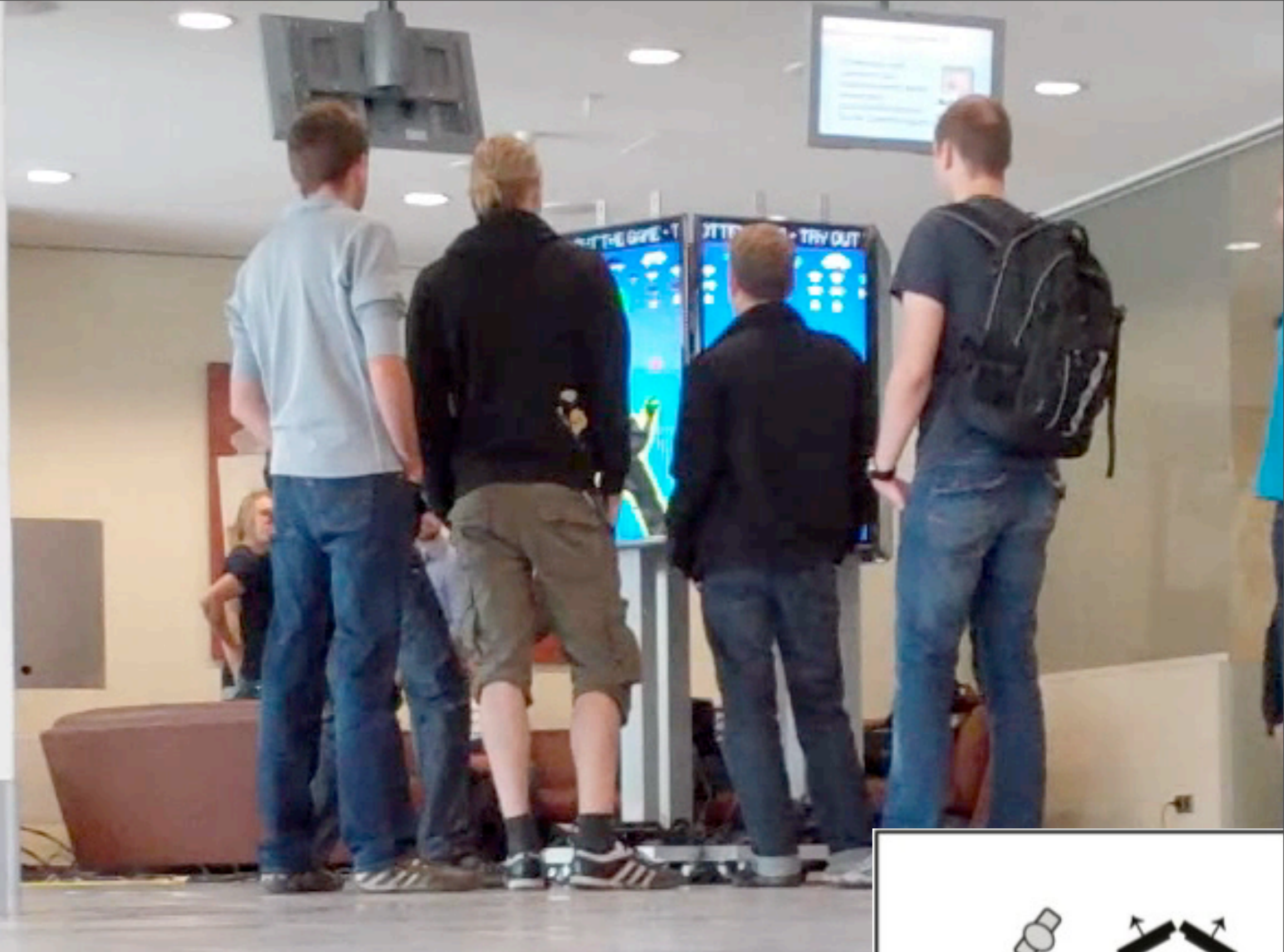


# Group Approaching

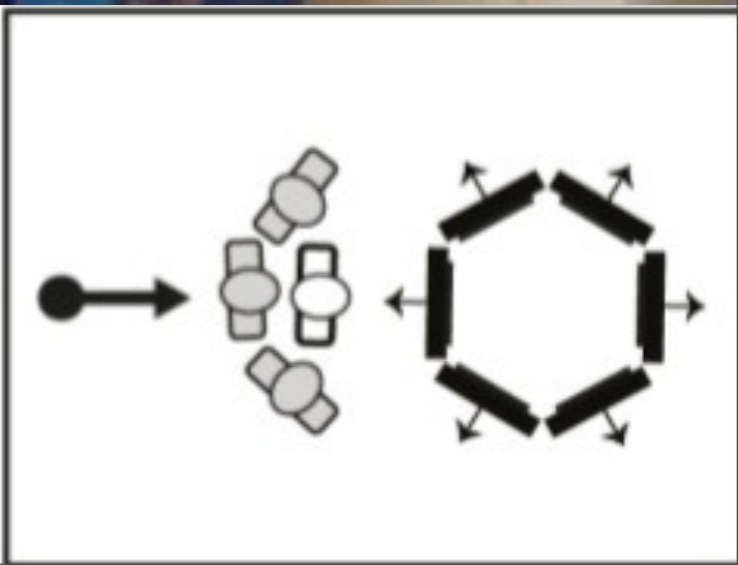


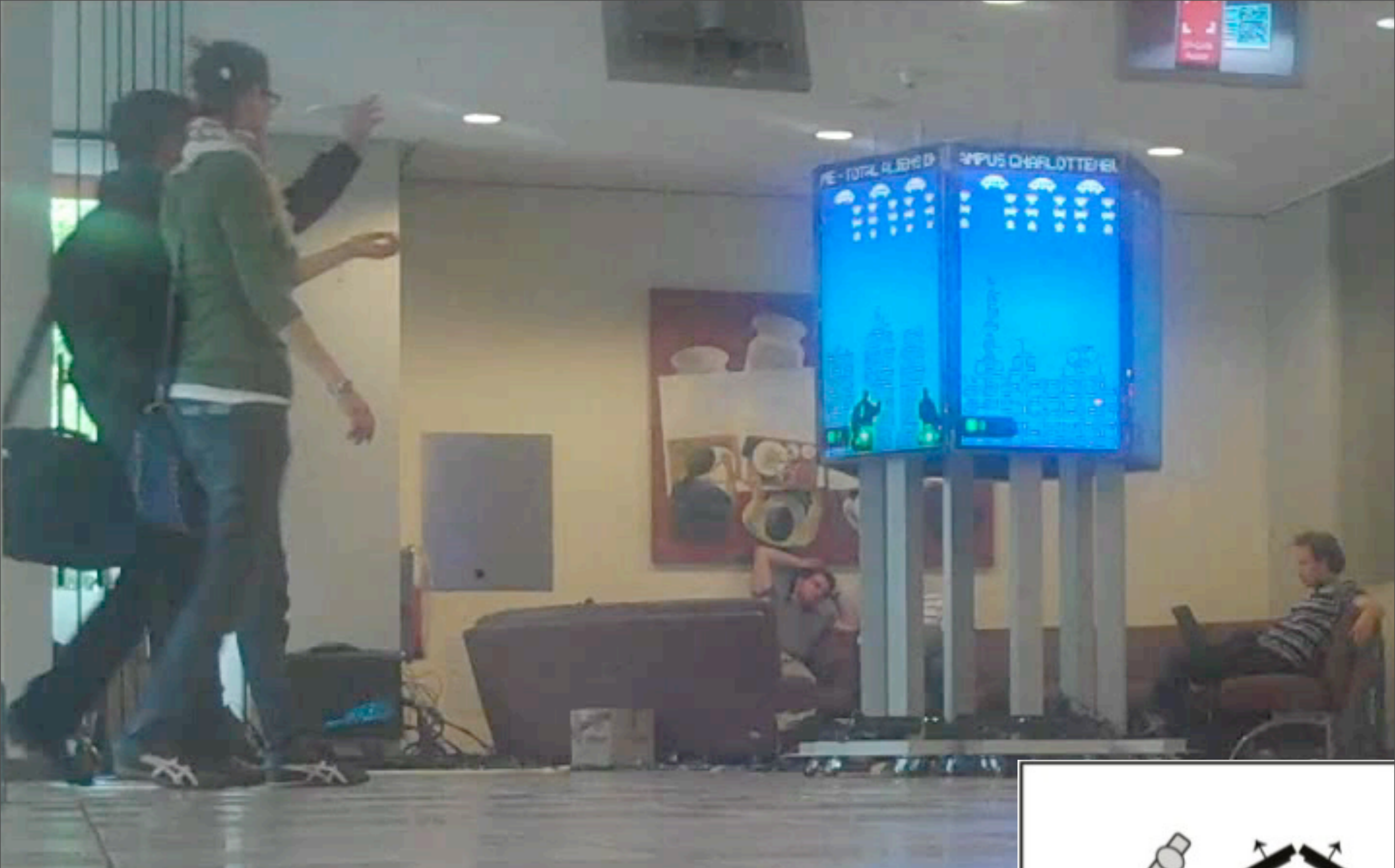
# Group Approaching



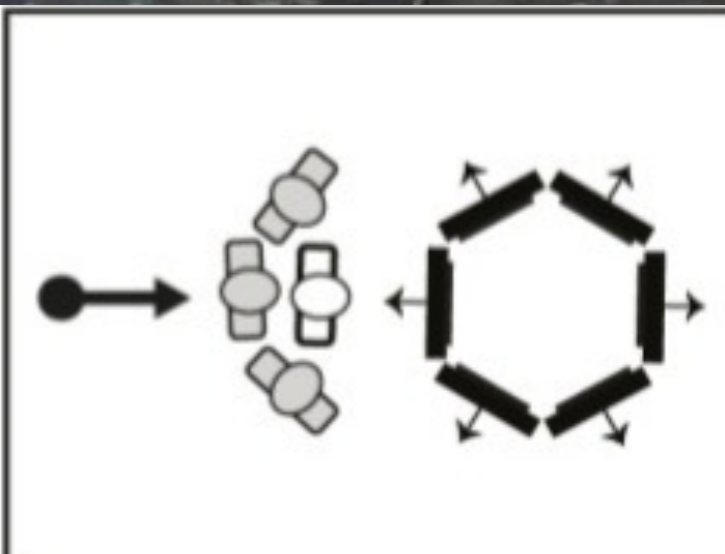


# Group Approaching





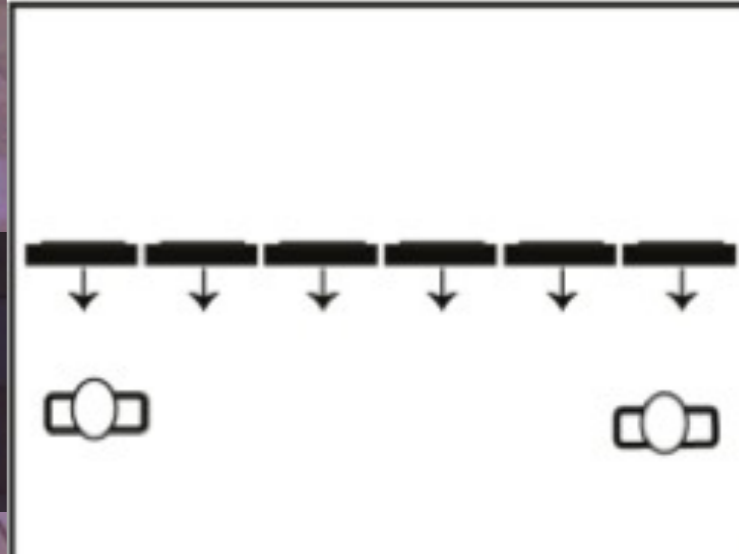
# Group Approaching



# Positioning



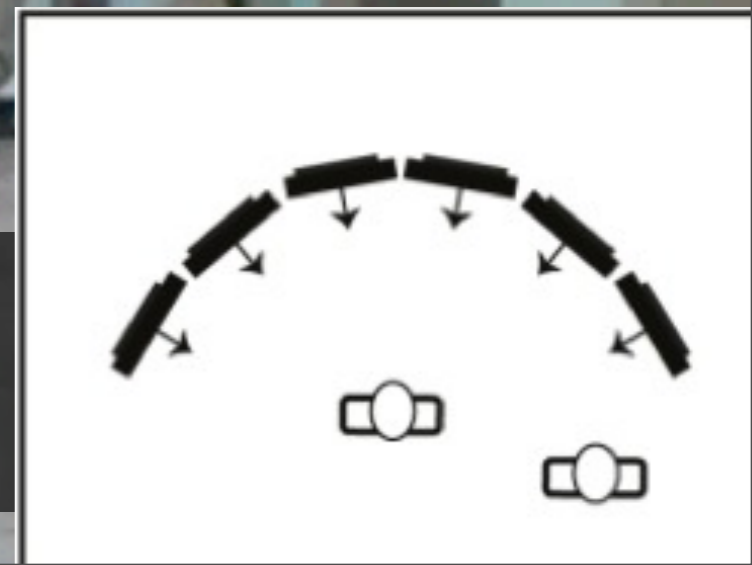
# Individual Positioning

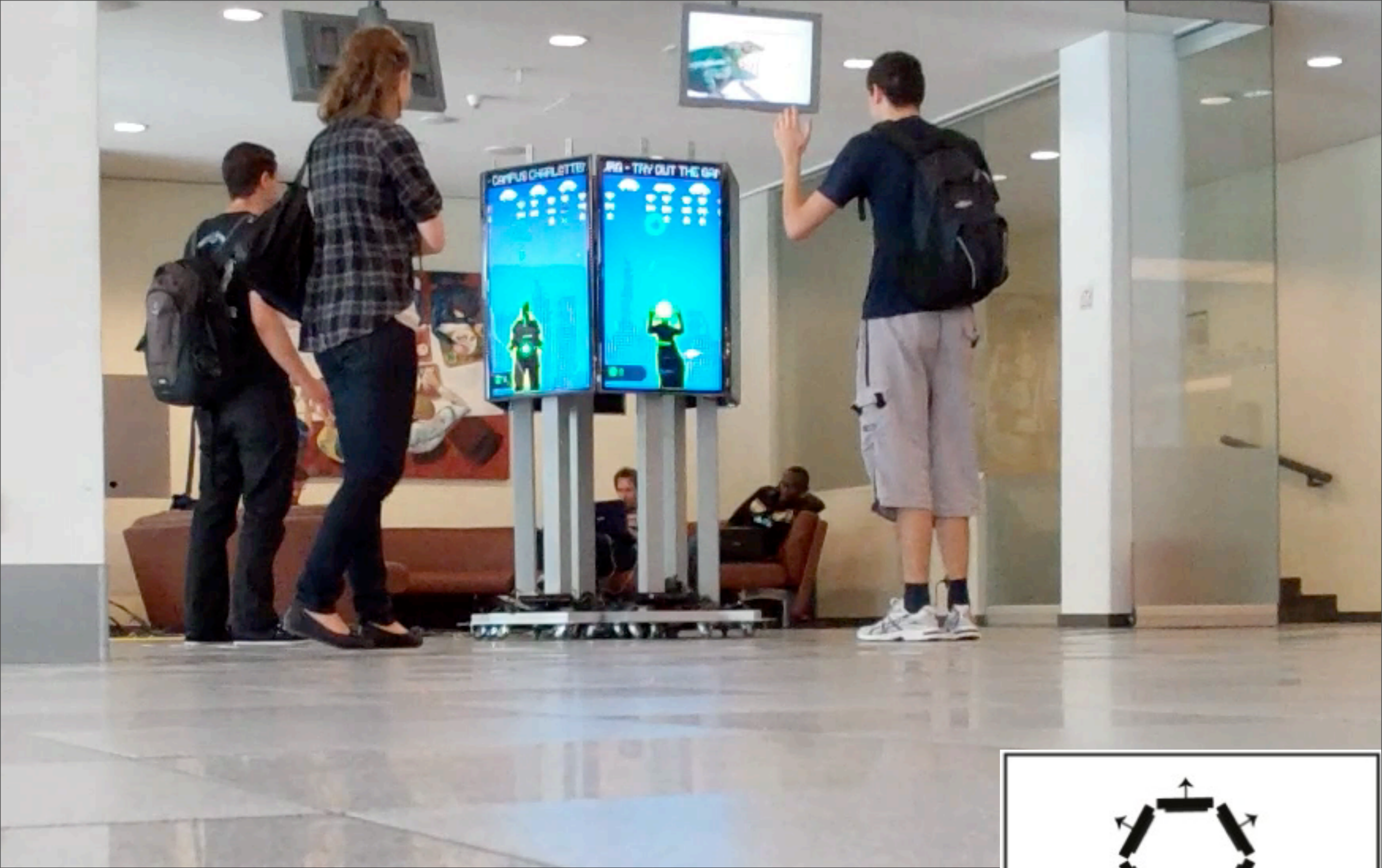




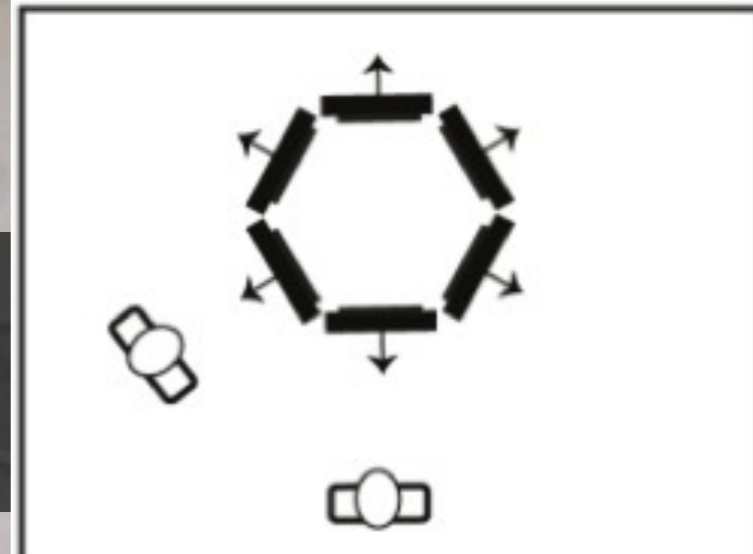


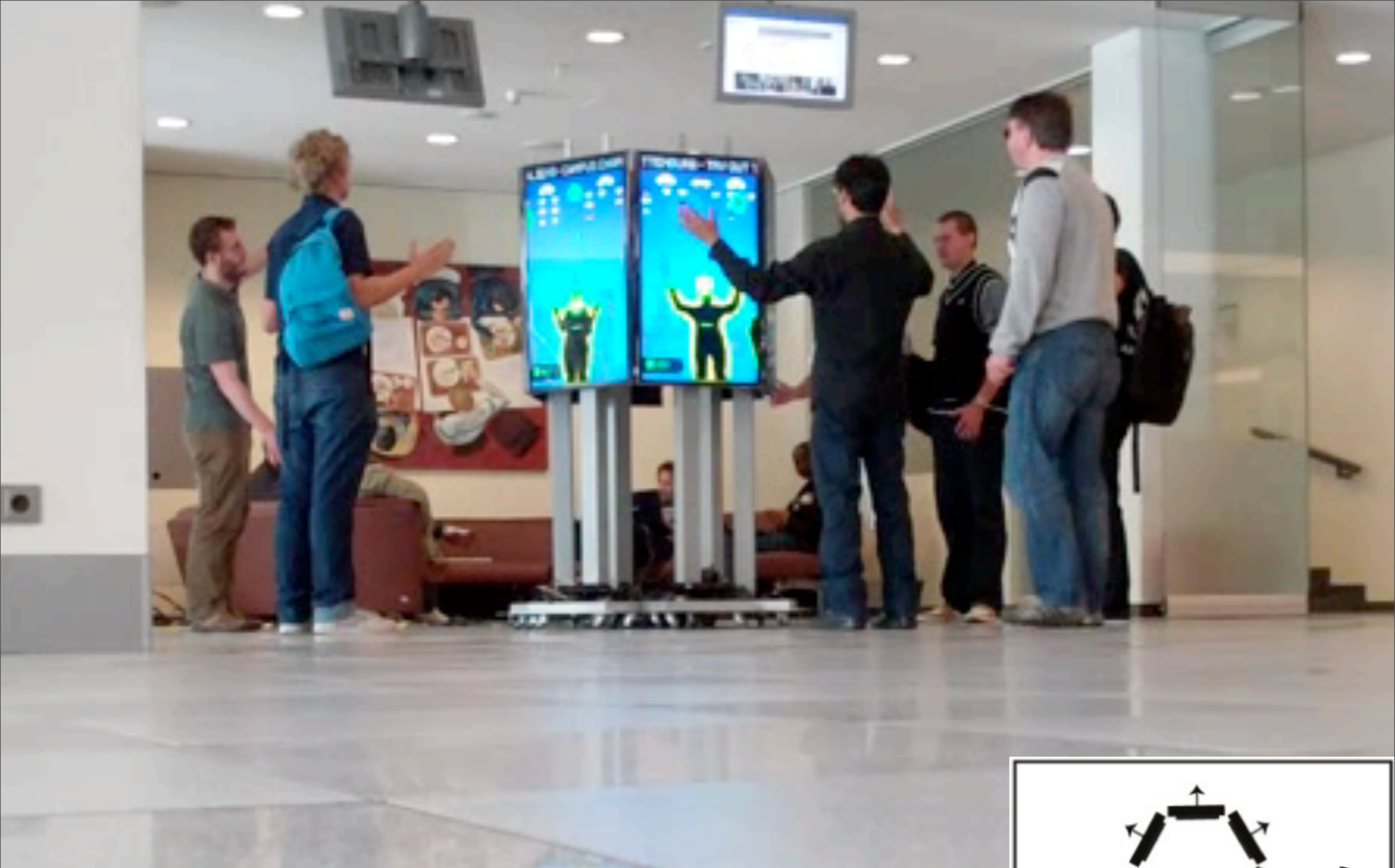
# Individual Positioning



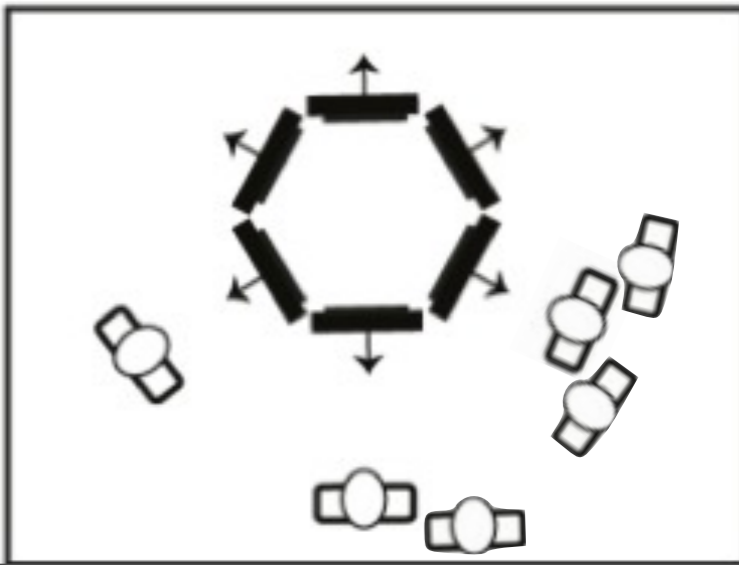


# Individual Positioning





# Group Positioning



# **Social Learning**





# **Honey Pot Effect**





# **Social Embarrassment**









# Performance



**Bumping**



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Albany, NY  
12214  
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NOT HAVE TO  
ALIENS DESTROYED?  
- CAMPUS CHARLETT  
JUSTIFY OUT THE GAP  
TOTAL ALBANY FOR  
CHARLETT



*Chained Display*

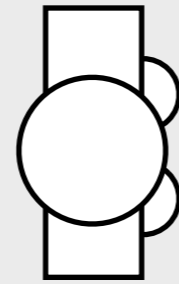
Field Study

**Design Space**

## **Nimbus & Focus:**

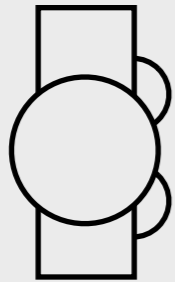
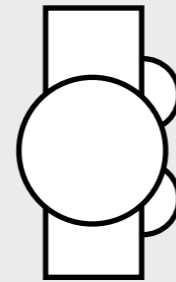
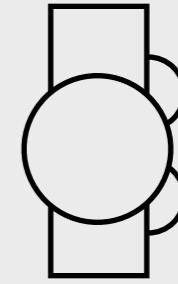
Tools for analysing differences between  
Chained Displays in a systematic way

# **Design Space**



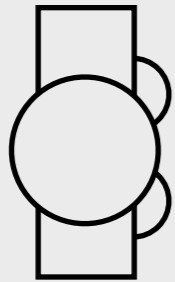
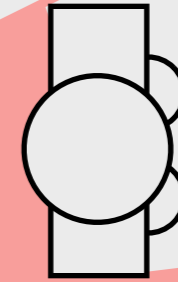
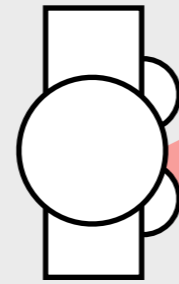
**Focus:**      ***What can I observe?***

*“Sub-space within which a person focuses their attention”*



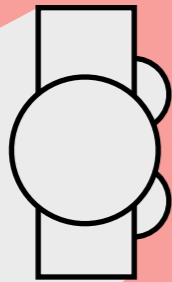
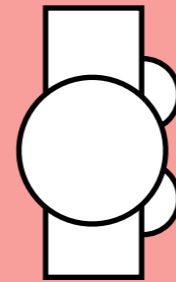
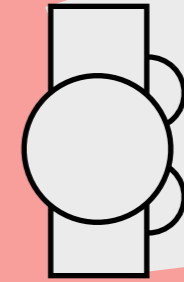
**Focus:** ***What can I observe?***

*“Sub-space within which a person focuses their attention”*



**Focus:**      ***What can I observe?***

*“Sub-space within which a person focuses their attention”*



**Nimbus:** *Where can I be perceived?*

*“Sub-space within which a person projects their presence”*

# Nimbus & Focus

## Related Work

- Virtual reality [Benford et al. 93]
- Privacy [Boyle et al. 05; Mataxas et al. 08]
- Multimedia streams [Fernado et al. 04]

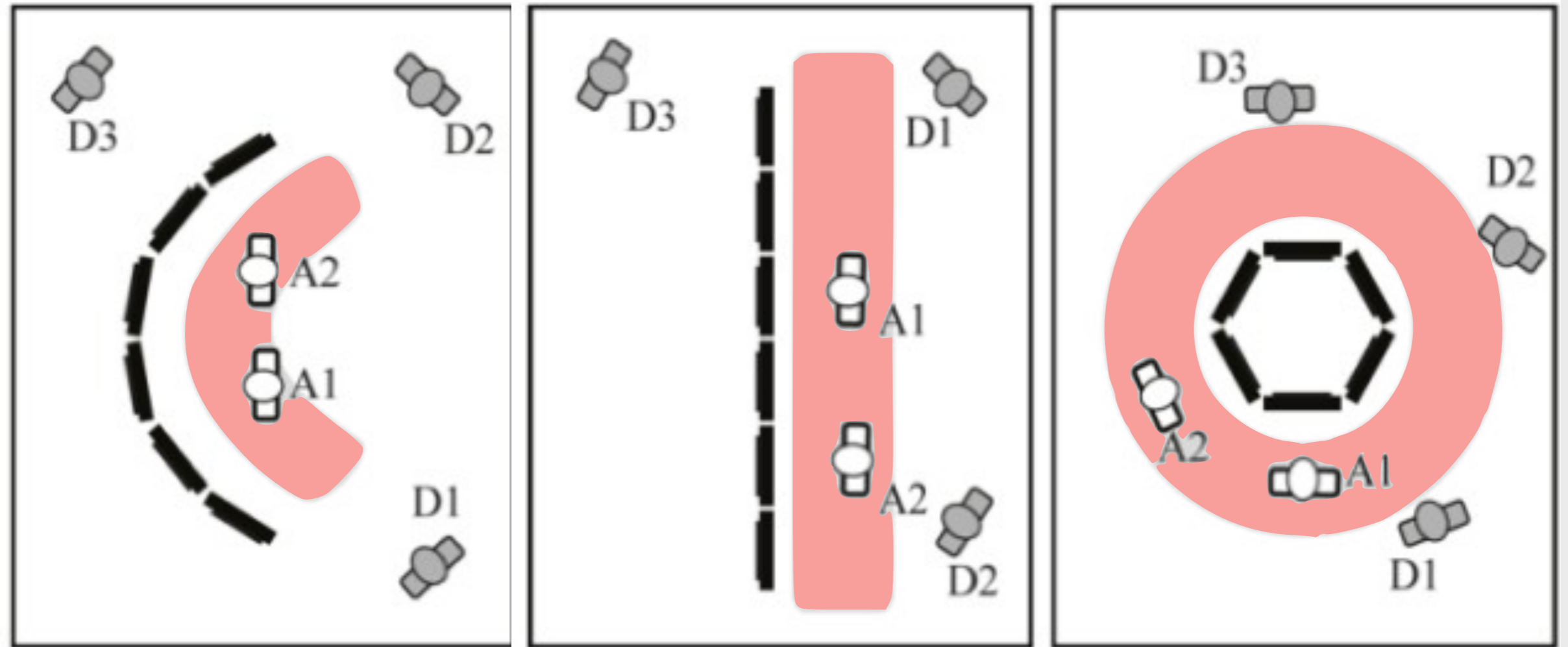
## Contributions

- **Interactive Public Displays**
- **from people to system**



# System

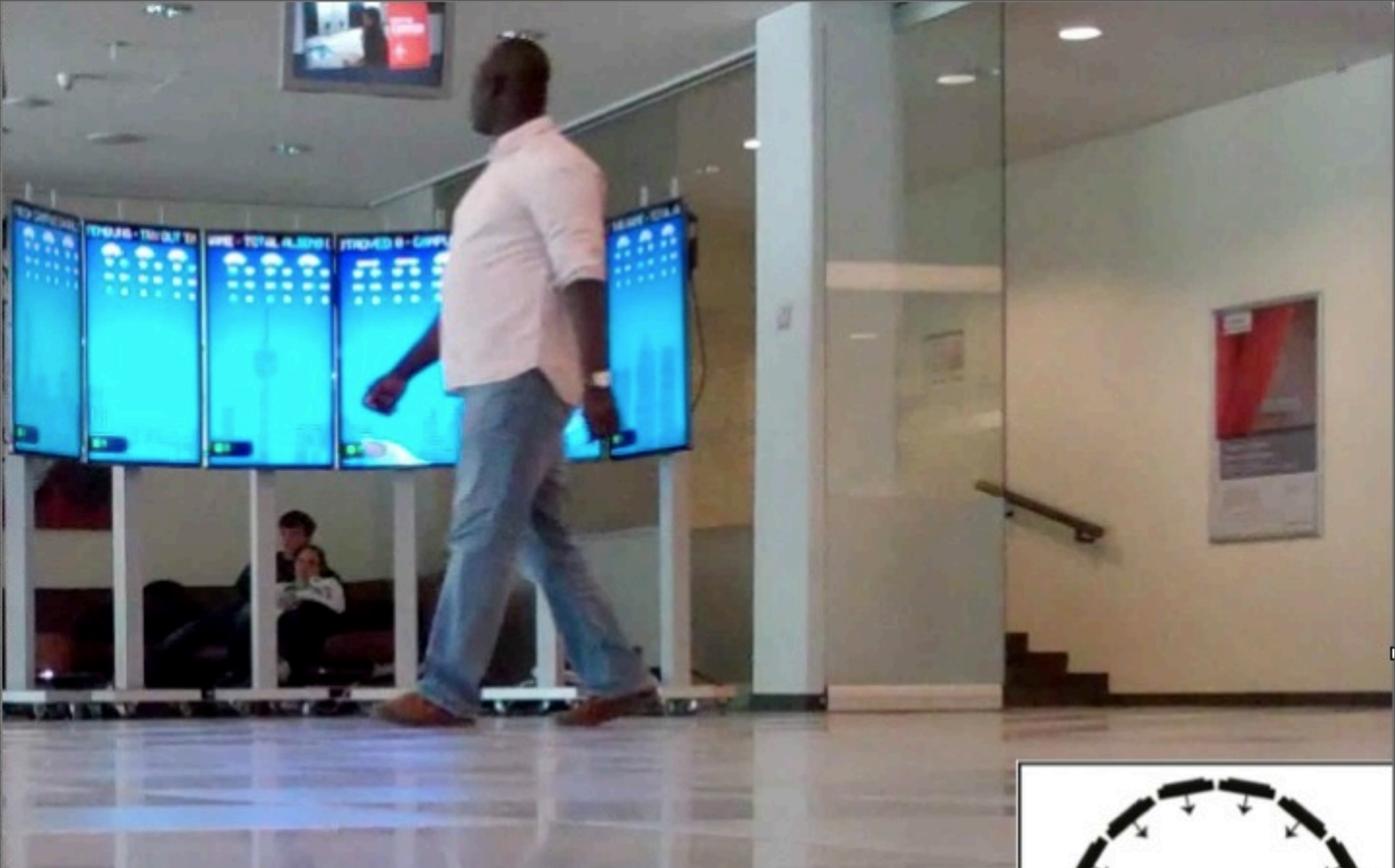
**Focus:** *What can I observe?*



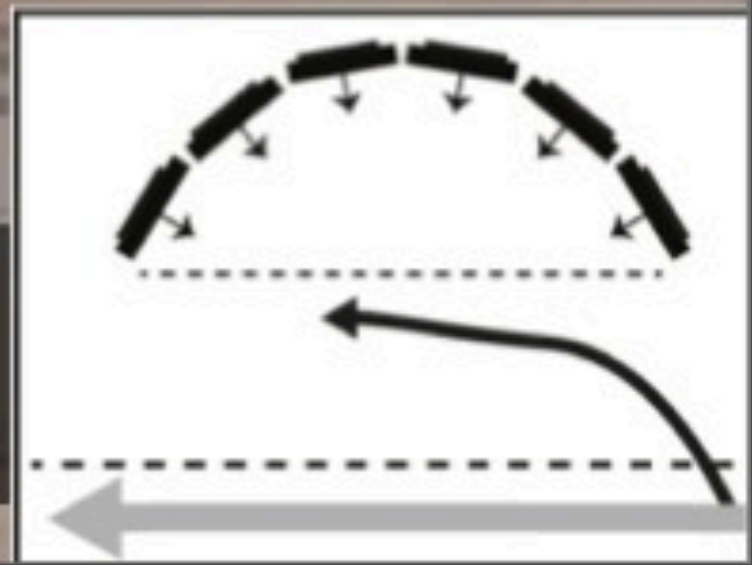
**Interaction area** increases with curvature

Inspired by the concept of Aura  
[Benford et al.]

# Examples

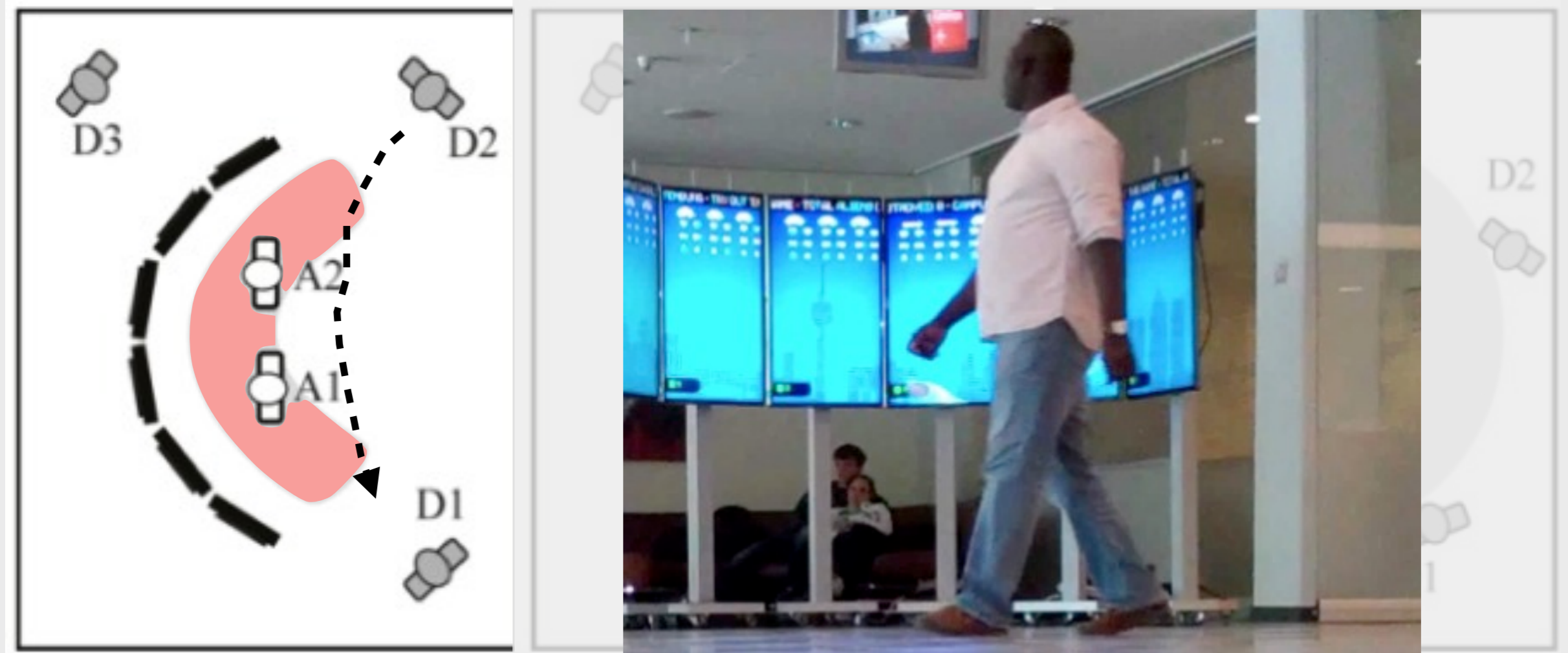


Individual Approaching (**Passer-by**)



# System

**Focus:** *What can I observe?*





ENBURG - TRY OUT THE

GAME - TOTAL ALIENS D

ESTROYED: 187 - CAMPUS

ENBURG - TR

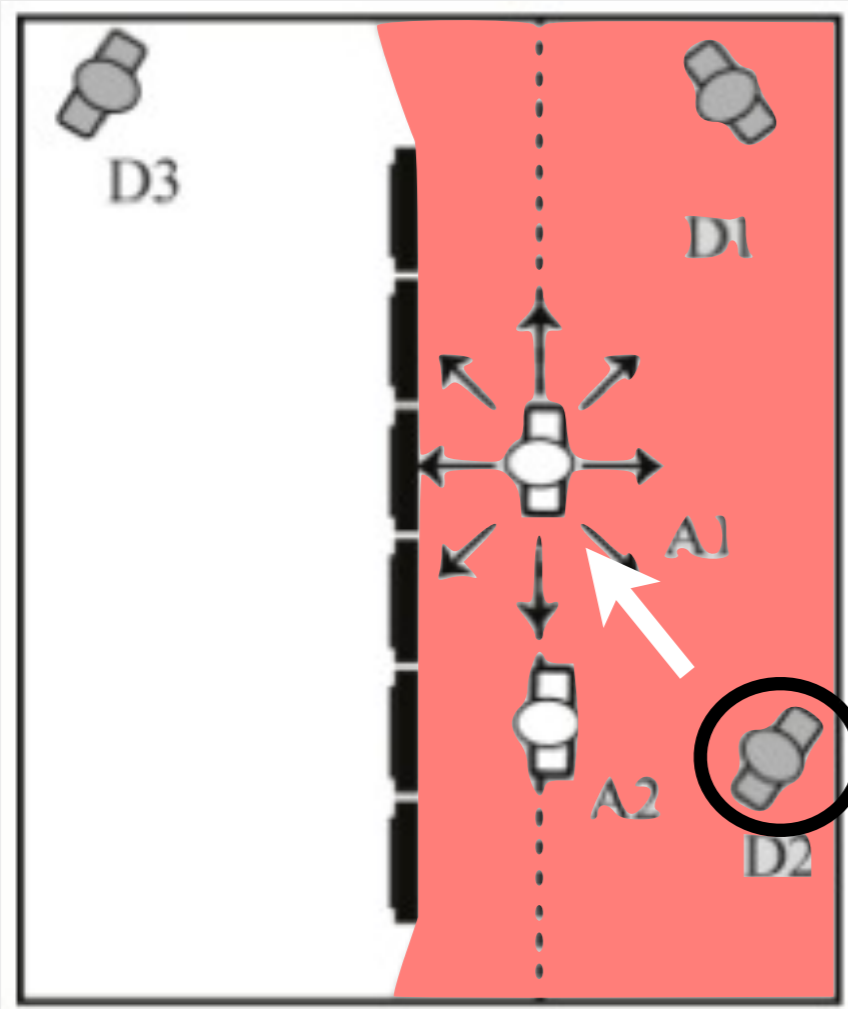
UT THE GAME - TOTAL

ENBURG - CAMPUS CHARLO



# Actor

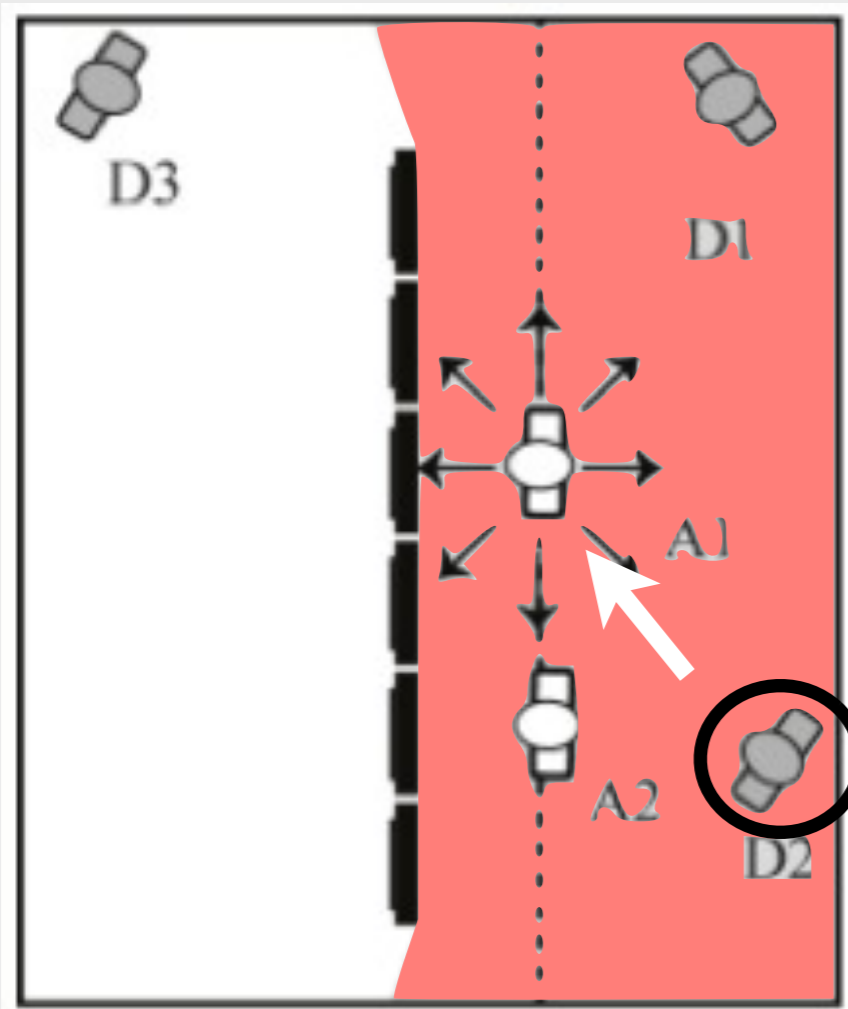
## Nimbus



*Where can I be perceived?*

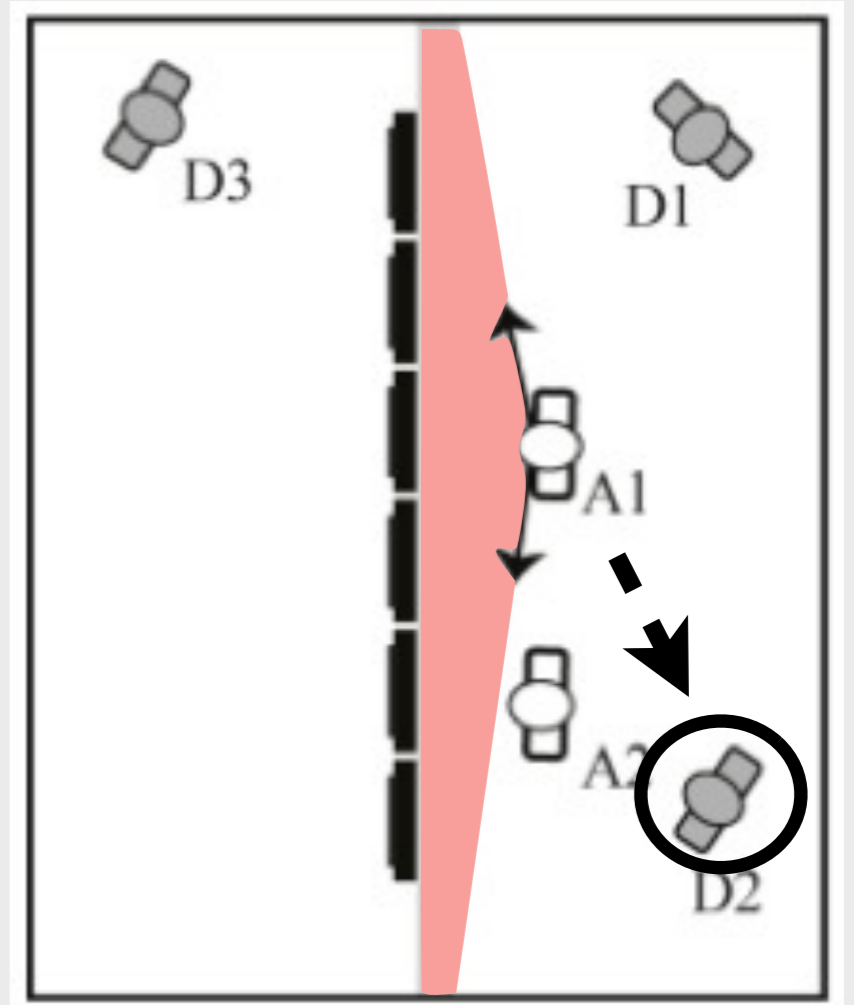
# Actor

## Nimbus



*Where can I be perceived?*

## Focus

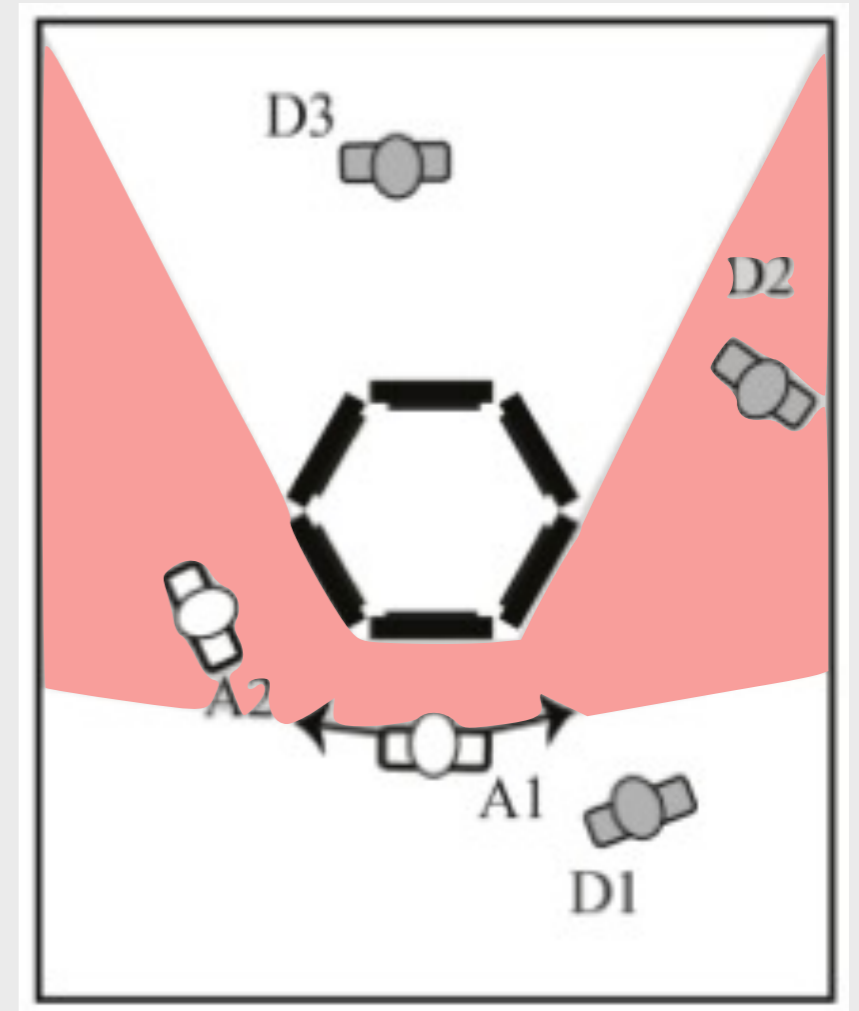


*What can I observe?*

# Actor

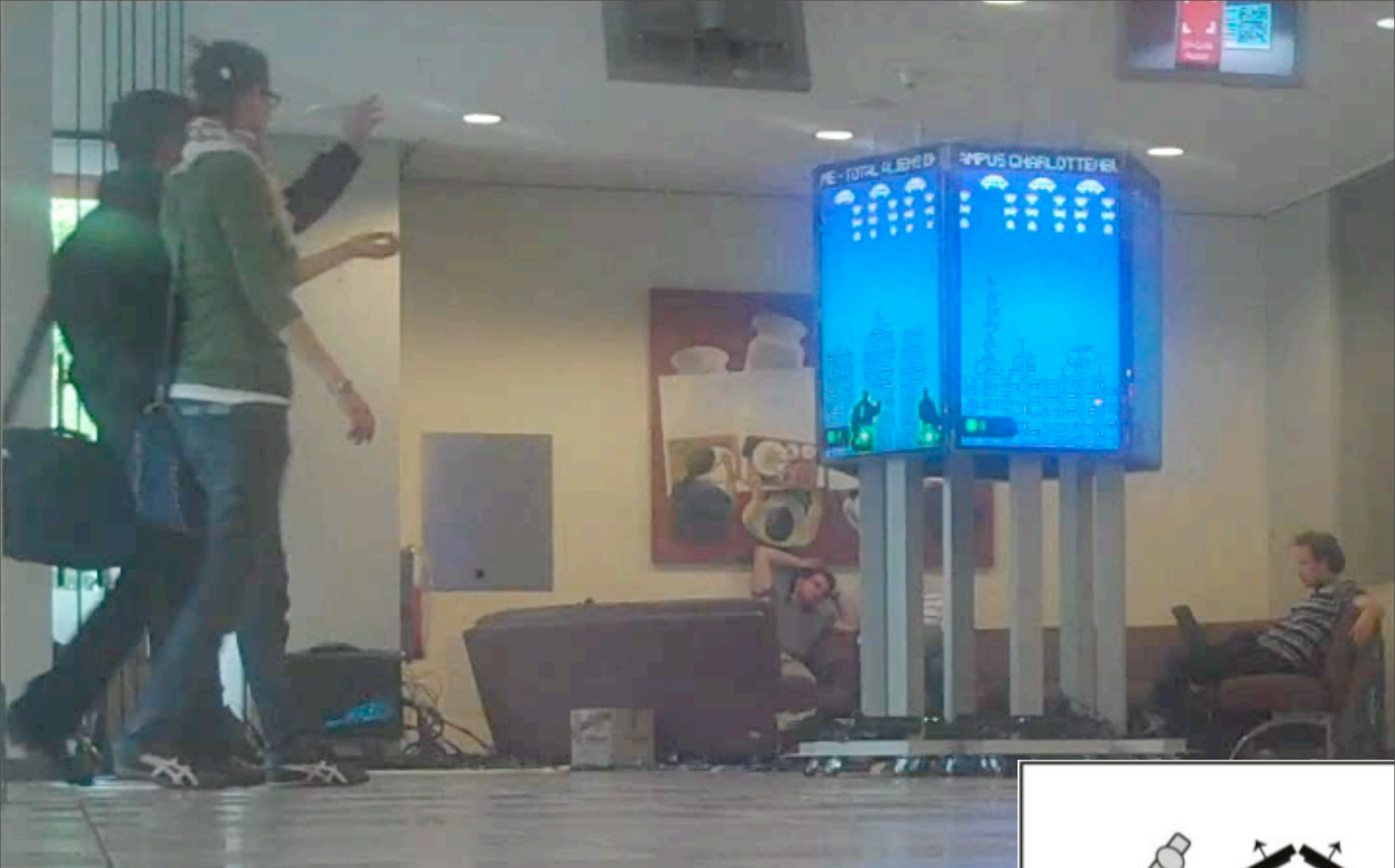


## Focus

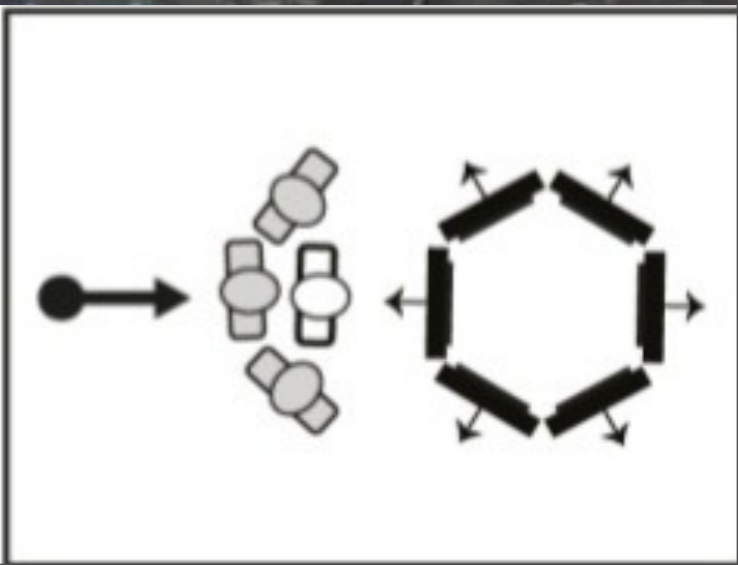


*What can I observe?*





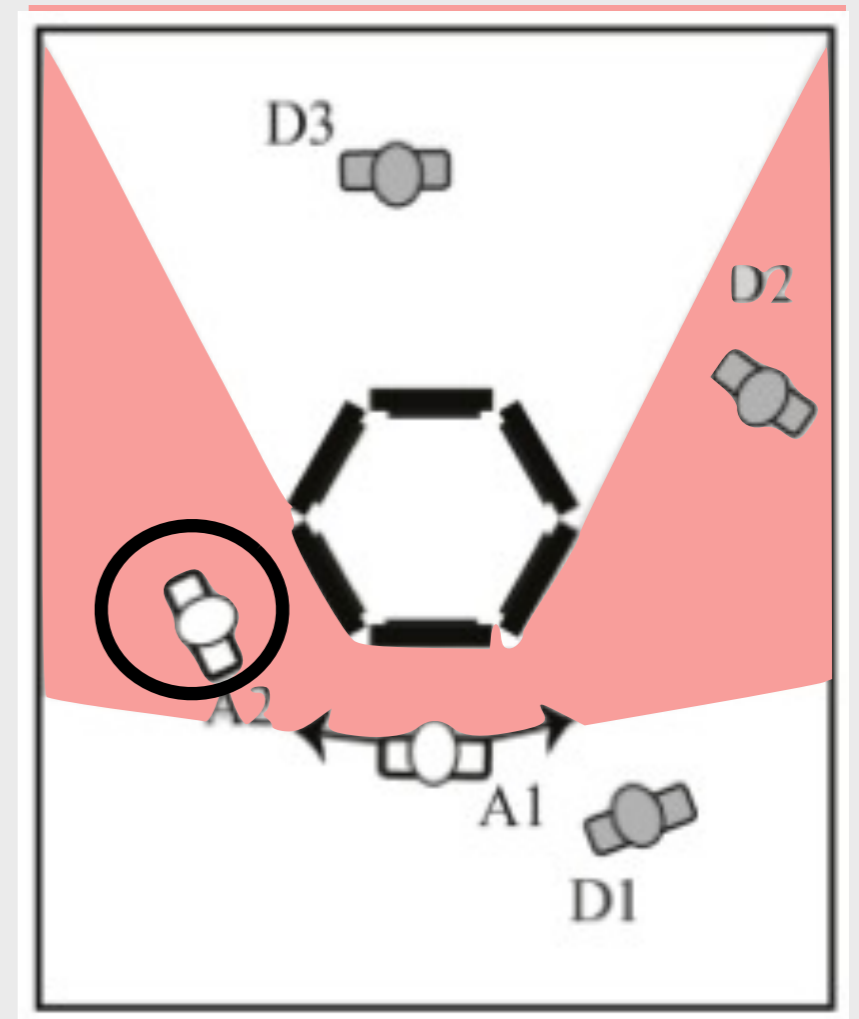
# Group Approaching



# Actor



## Focus

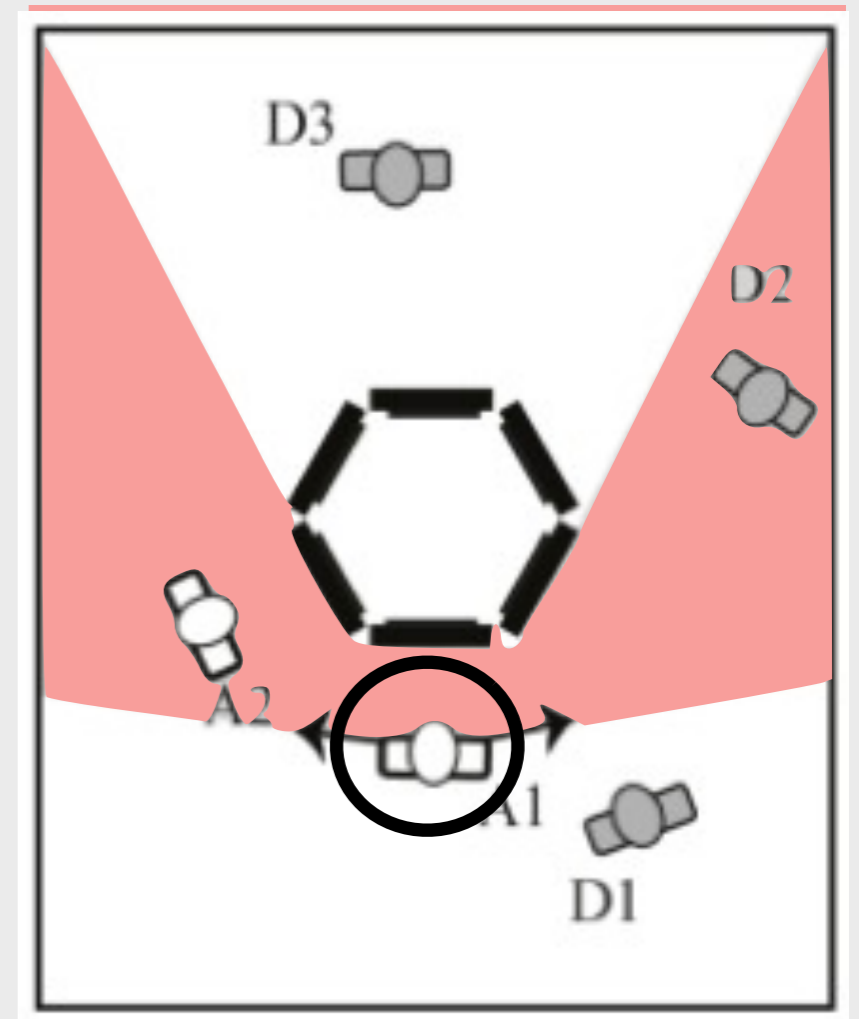


*What can I observe?*

# Actor



## Focus

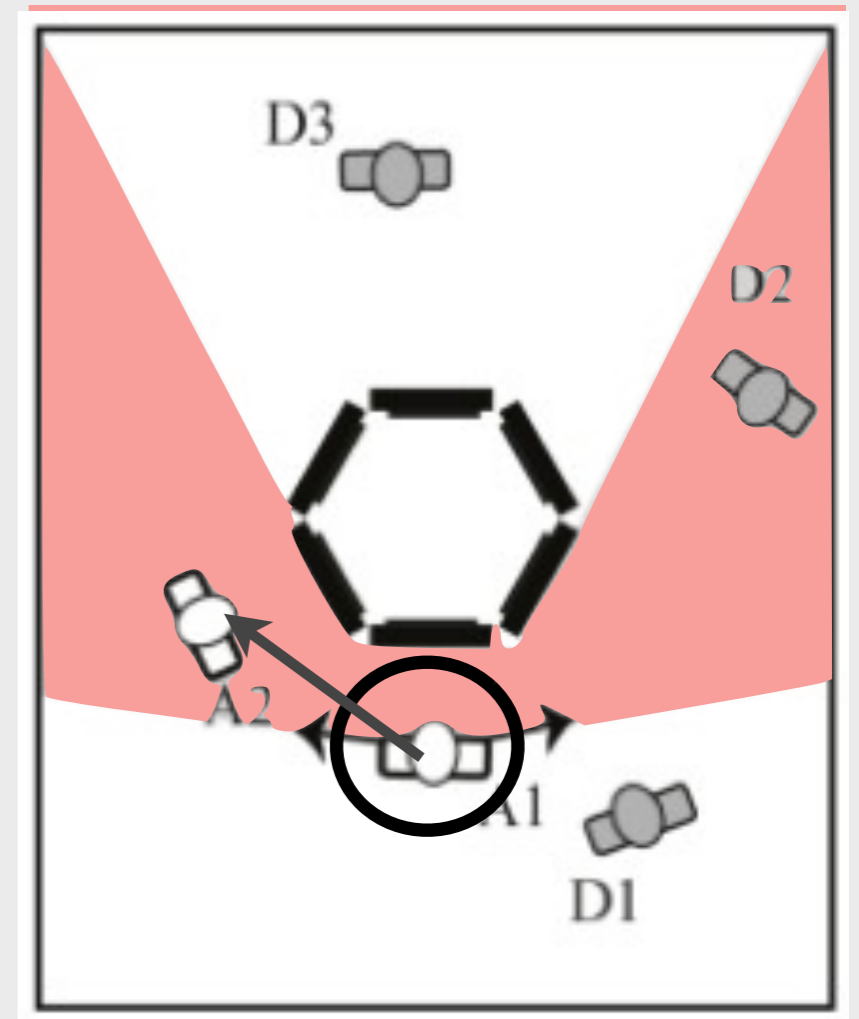


*What can I observe?*

# Actor



## Focus

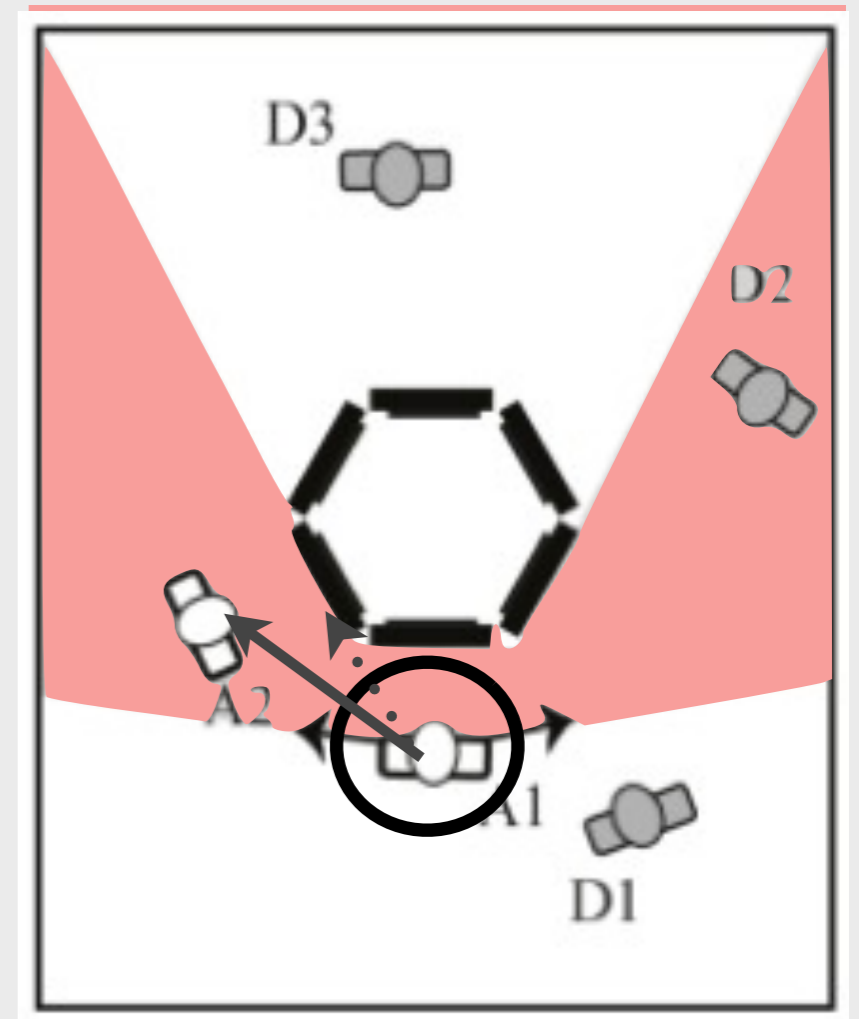


*What can I observe?*

# Actor



## Focus

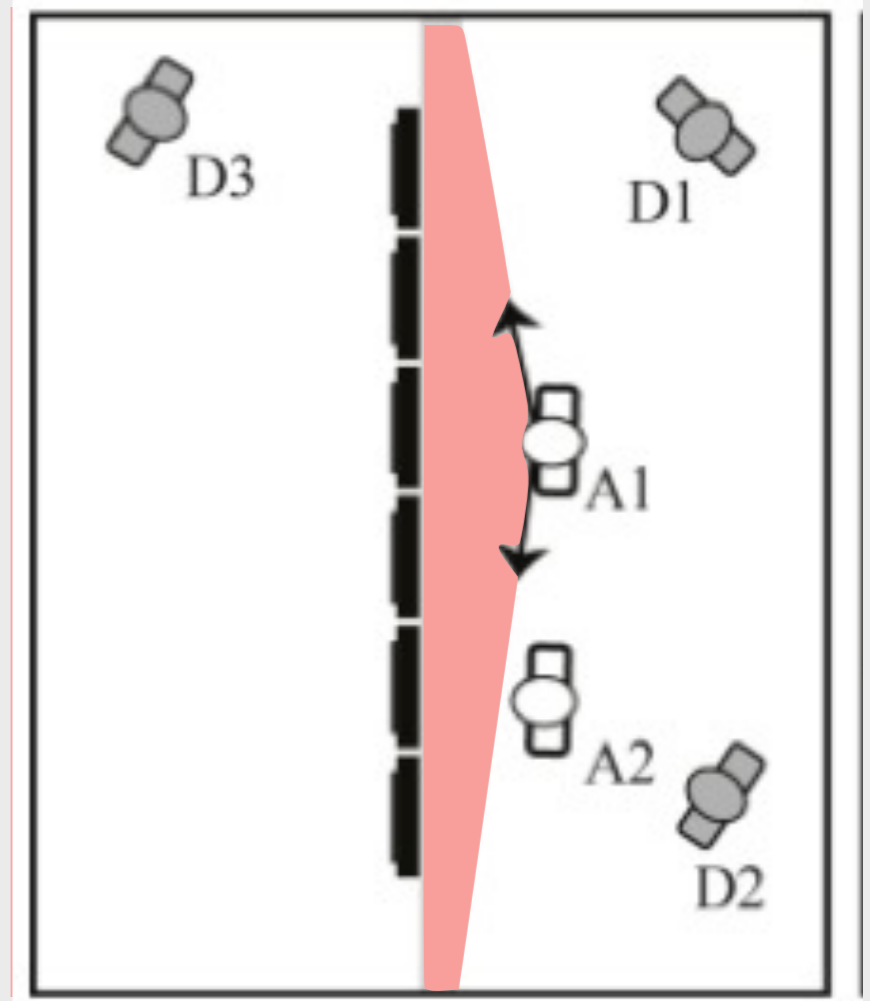


*What can I observe?*

# Actor



## Focus



*What can I observe?*

## **Nimbus & Focus:**

Tools for analysing differences between  
Chained Displays in a systematic way

# Conclusion

## Research Question

- How can the form factors of interactive public displays influence people's behavior

## Approach

- Chained Display
- Field study
- Design space: Nimbus & Focus



# Main Findings

## Concave & Hexagonal

- acts as a stage for single users from a group

## Flat

- Entire group can play
- Triggers the highest Honeytrap effect





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**T-LABS**



# Chained Displays