

Challenges and Design Space of Gaze-enabled Public Displays

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Public displays



Public Display in Oulu, Finland



<http://www.thinvent.in/railways/projects/atvm/>

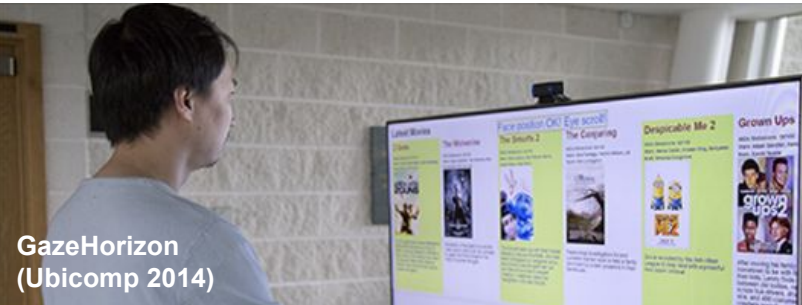


GazeHorizon
(Ubicomp 2014)



Looking Glass
(CHI 2012)

Gaze-enabled Public Displays



GazeHorizon
(Ubicomp 2014)



Khamis et al.
(Ubicomp 2015 Adj.)



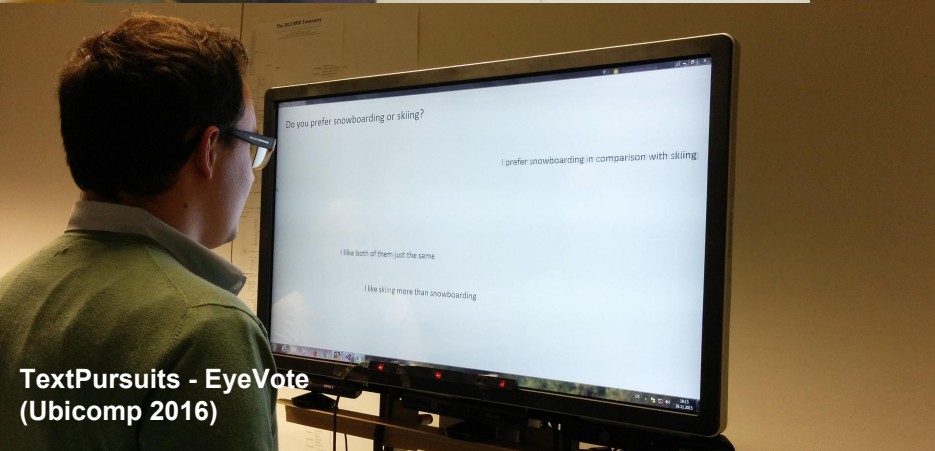
SideWays
(CHI 2013)



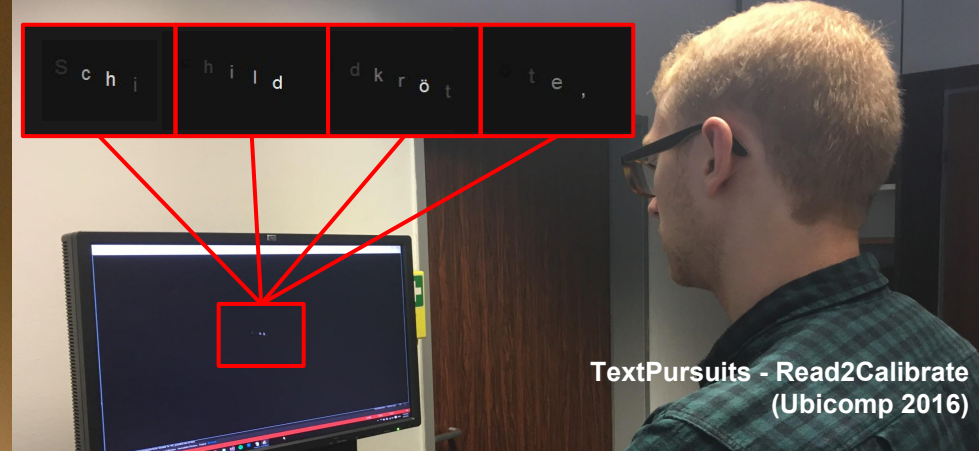
Aggregaze
(UIST 2016)



Pursuits
(Ubicomp 2013)



TextPursuits - EyeVote
(Ubicomp 2016)



TextPursuits - Read2Calibrate
(Ubicomp 2016)

Challenges of Gaze-enabled Public Displays

Challenge 1: Calibration

Public displays require **immediate usability**

+

Classical eye tracking requires **time consuming calibration**

=

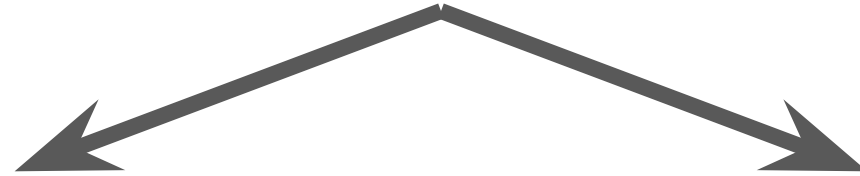
“Public displays cannot afford requiring time-consuming calibration”



<https://youtu.be/IanfIRfx-wl>

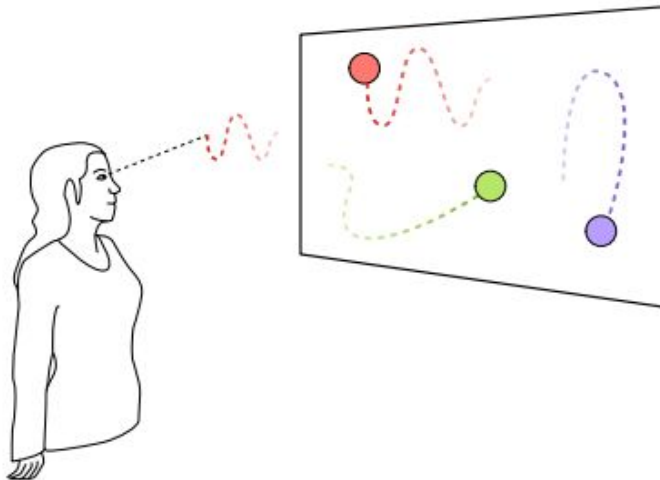
Challenges of Gaze-enabled Public Displays

Challenge 1: Calibration

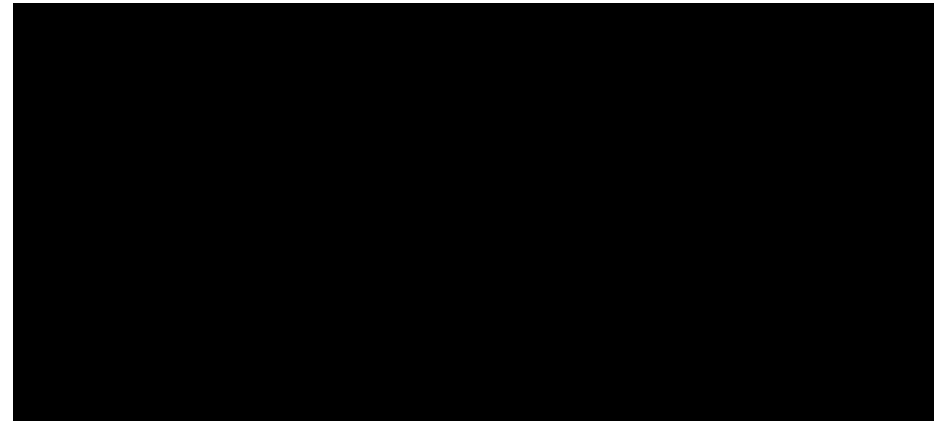


Use calibration-free techniques

Blend calibration into interaction



Pursuits
(UbiComp 2013)

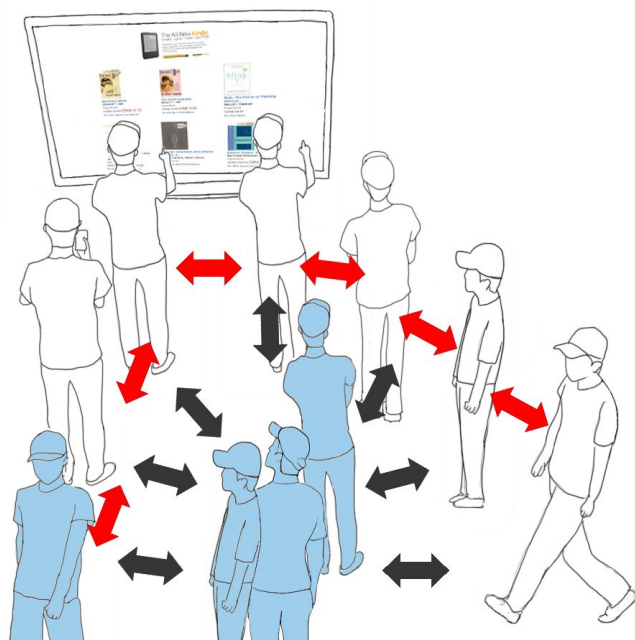


TextPursuits
(UbiComp 2016)

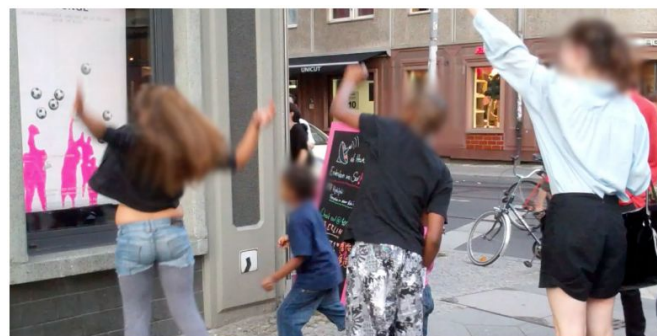
Challenges of Gaze-enabled Public Displays

Challenge 1: Calibration

Challenge 2: User Positioning



Proxemic Peddler
(PerDis 2012)

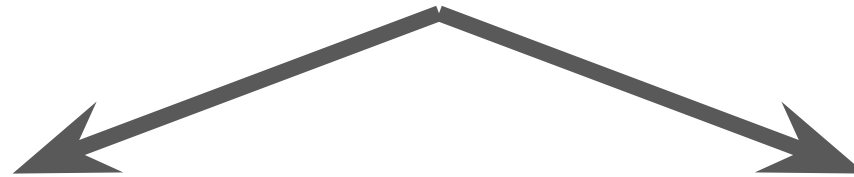


Looking Glass
(CHI 2012)

Challenges of Gaze-enabled Public Displays

Challenge 1: Calibration

Challenge 2: User Positioning

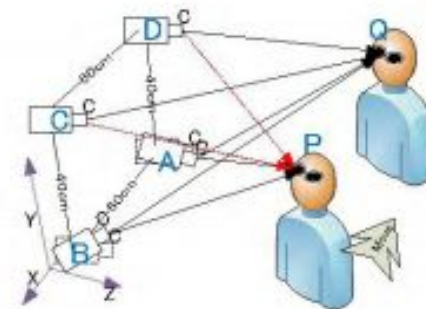


Guide users to the “sweet spot”

Active eye tracking



GravitySpot
(UIST 2015)



Active Eye-tracking System by Using Quad PTZ Cameras
(IECON 2007)

Challenges of Gaze-enabled Public Displays

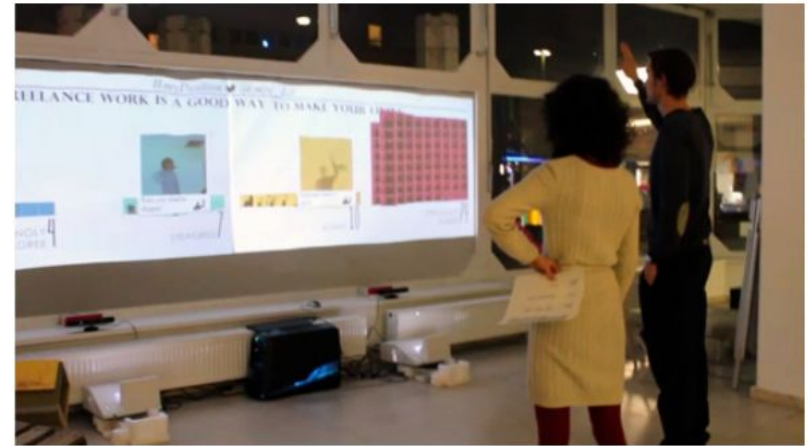
Challenge 1: Calibration

Challenge 2: User Positioning

Challenge 3: Multiple Users



Looking Glass
(CHI 2012)



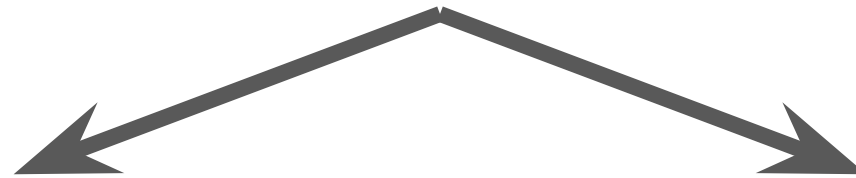
MyPosition
(CSCW 2014)

Challenges of Gaze-enabled Public Displays

Challenge 1: Calibration

Challenge 2: User Positioning

Challenge 3: Multiple Users



Use multiple eye trackers



A Collaborative Gaze Aware Information Display
(UbiComp 2015)

Use RGB cameras



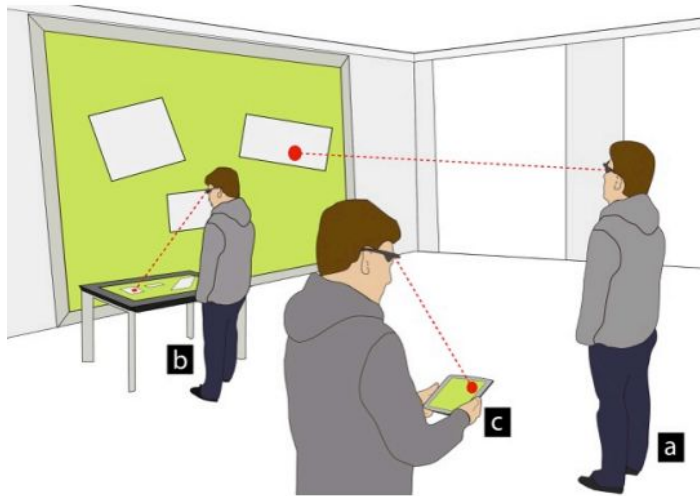
Aggregaze
(UIST 2016)

Mobile Eye Trackers?

Calibration needed only once

Flexible to user position

Multiple users can wear multiple mobile eye trackers



GazeProjector
(UIST 2015)



JINS MEME eye tracker

Take home messages

- Gaze-enabled public displays:
 - cannot afford classical calibration
 - must be flexible to user positioning
 - must support multiple users
- Until wearing mobile eye trackers becomes the norm, the challenges should be addressed using remote eye trackers.