

Sydney

Mumbai

17

17 FEB 2028

TODAY

- 8:30 Art
- 10:00 Recess
- 10:30 Math
- 12:00 Lunch
- 1:00 Language Arts
- 2:30 Dismissal

1:00 PM

SOCIAL STUDIES

er, ig, ur

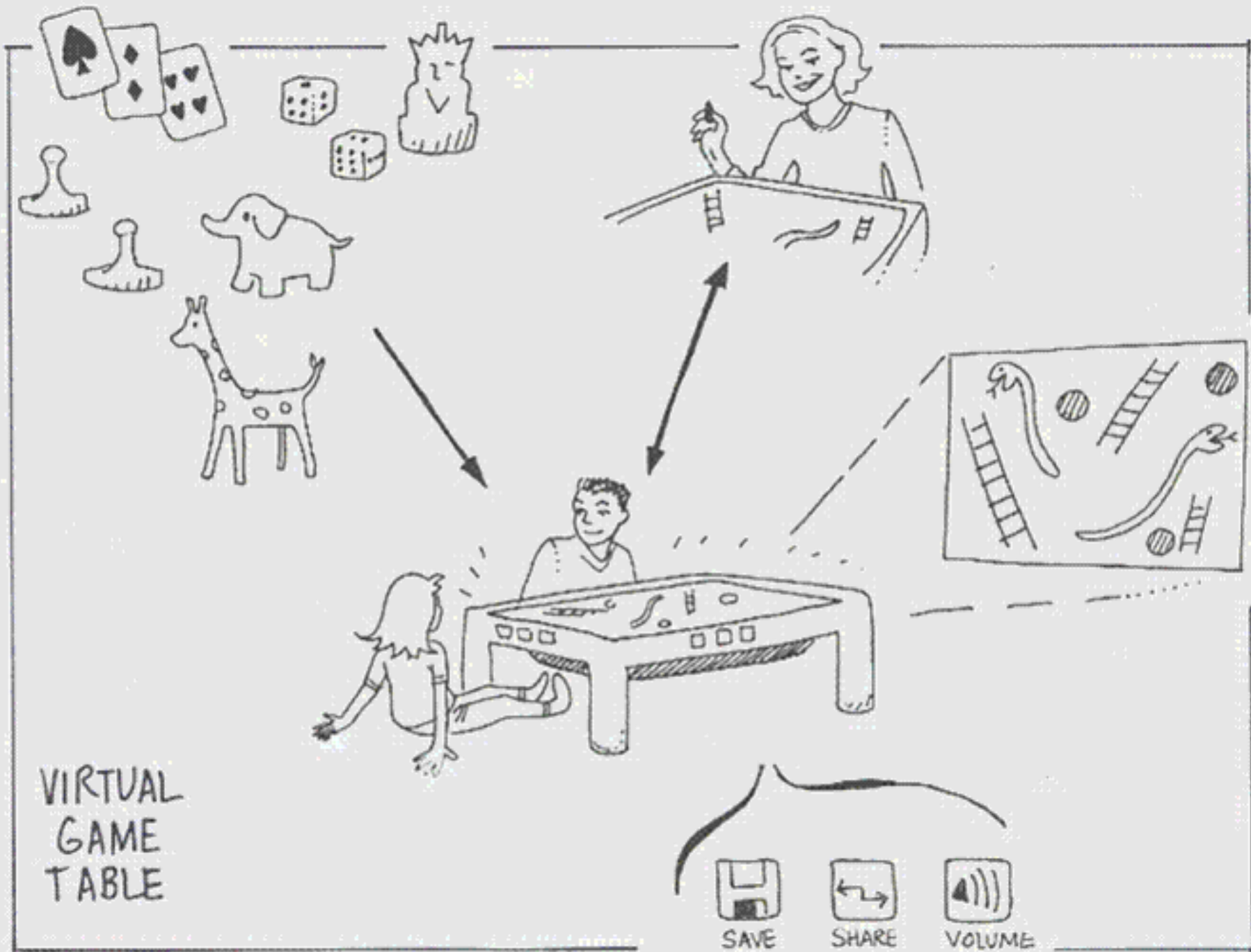


Human Scale Interactive Systems

Tim Large
Research Manager
Microsoft



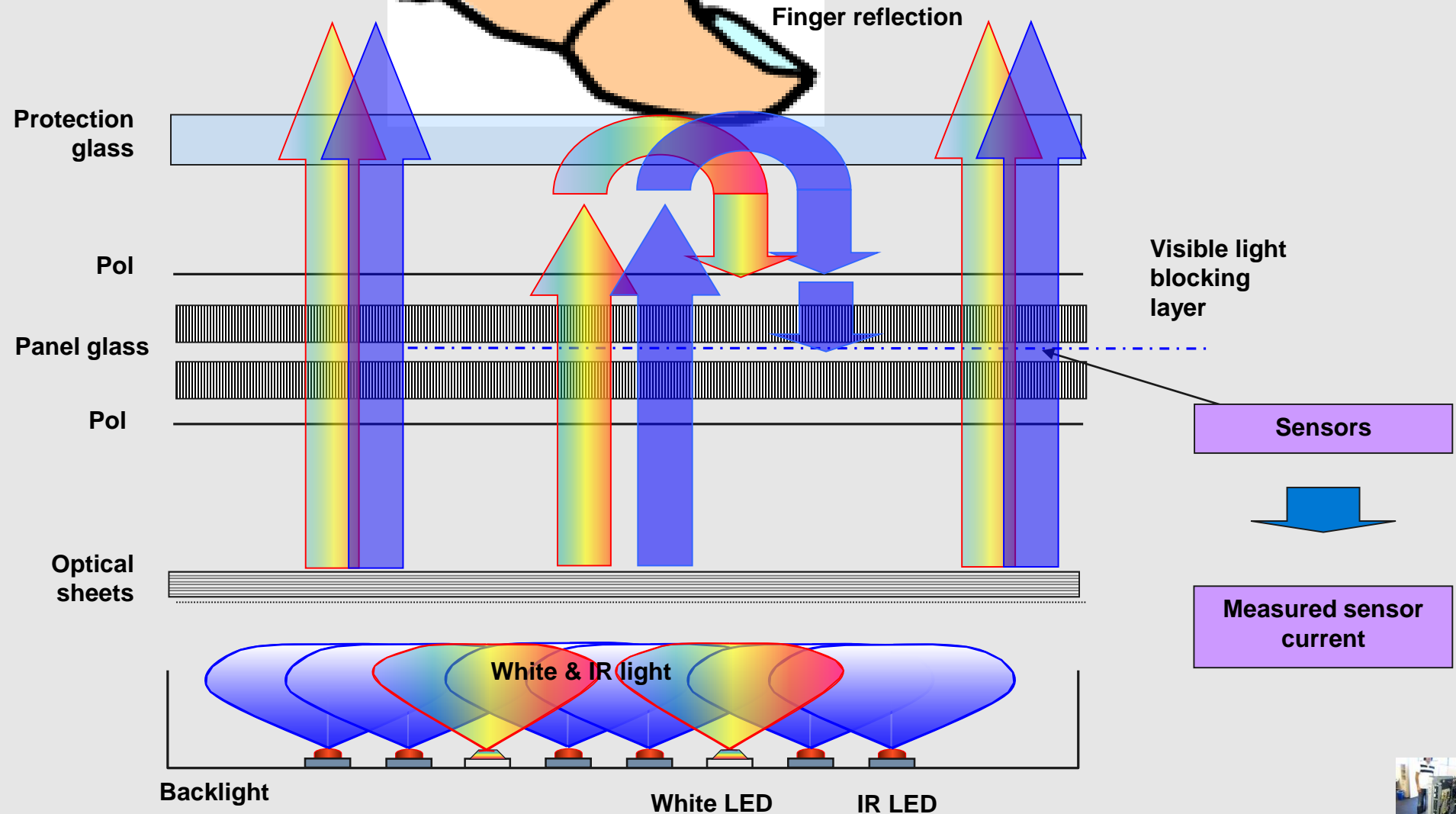
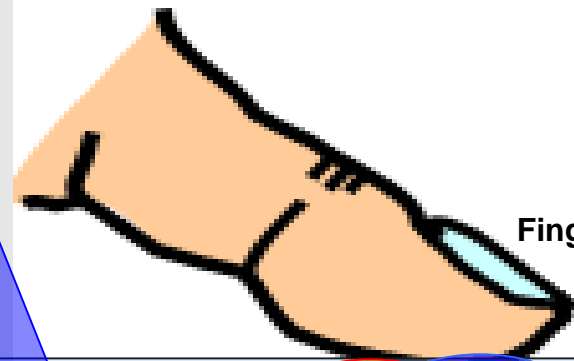
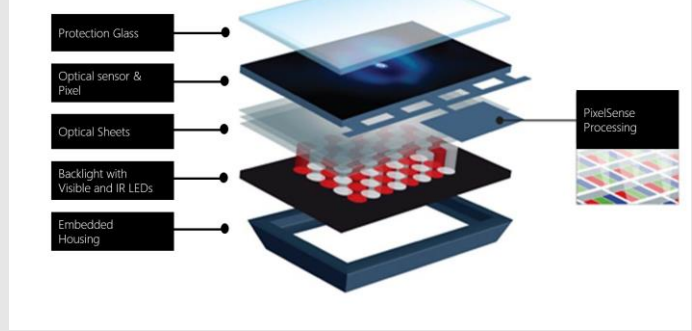




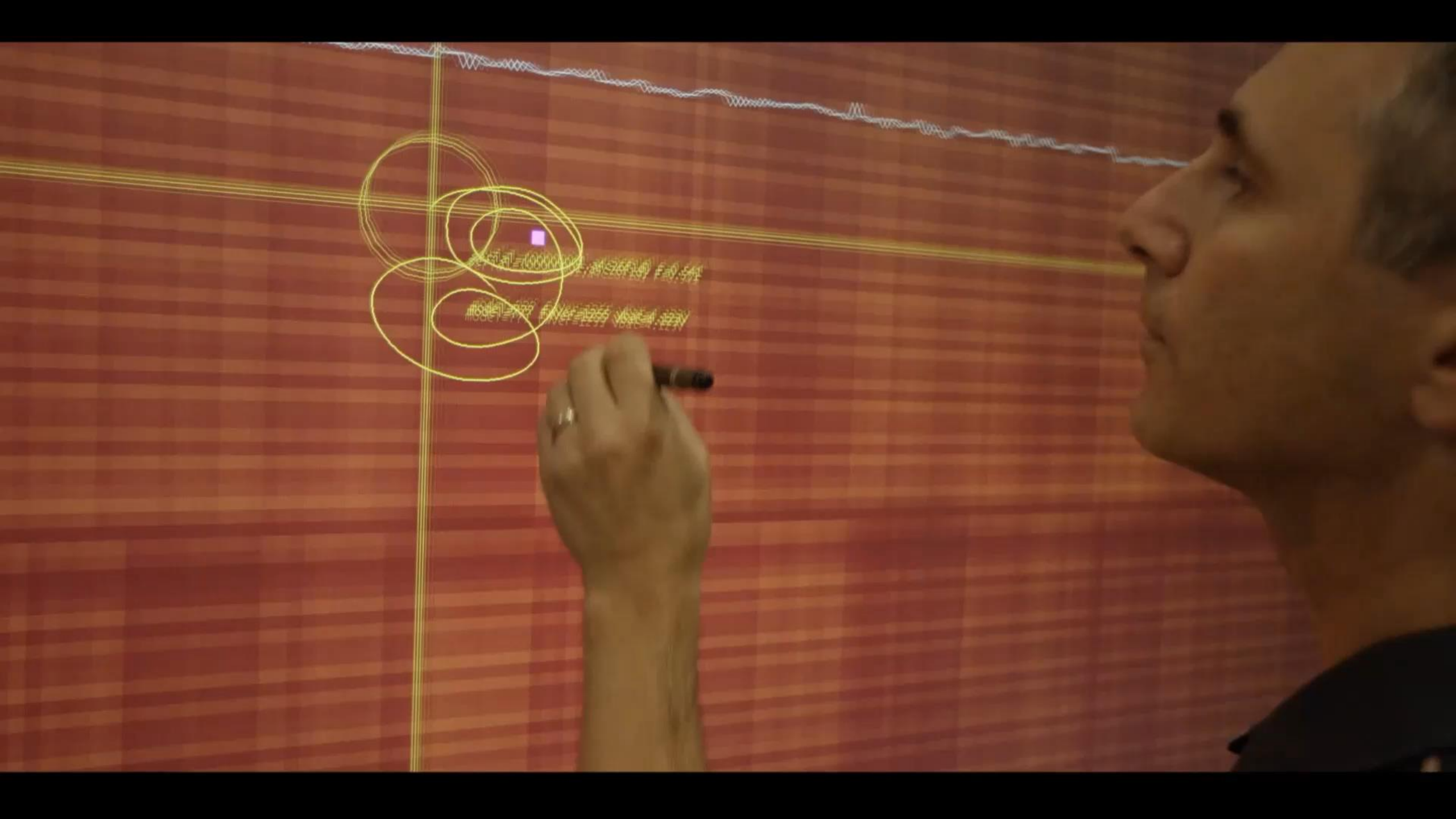
Surface Table – SUR 40

From Optical In-Cell Touch

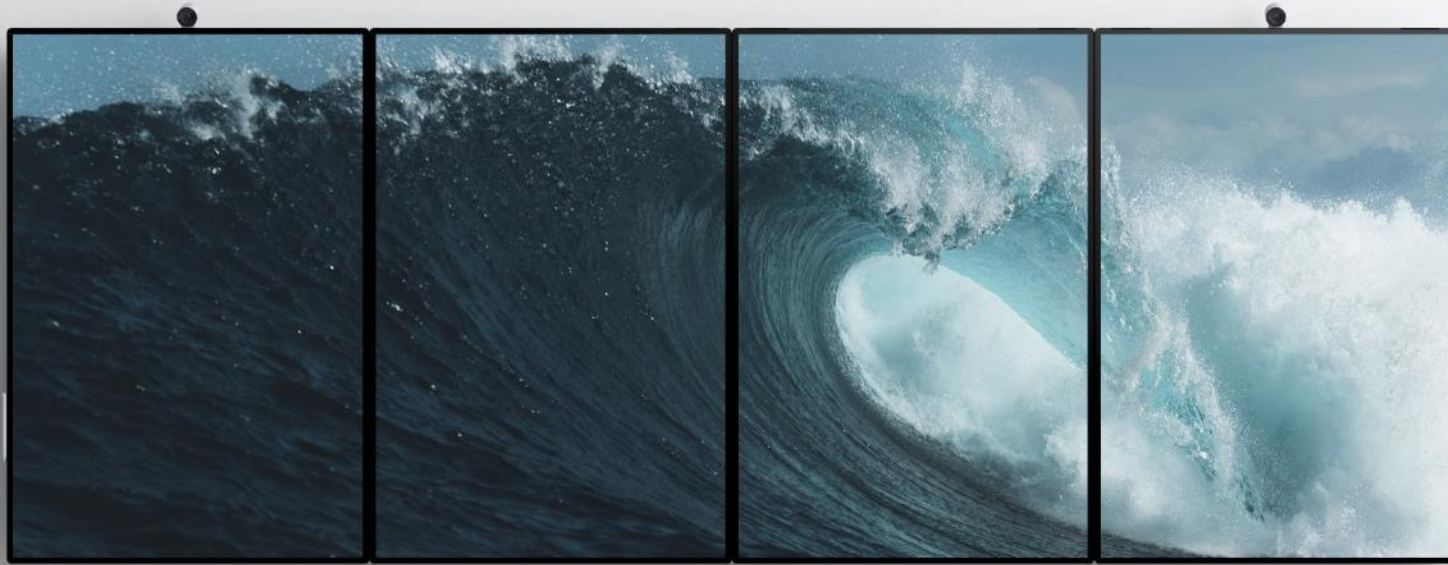
(2009)







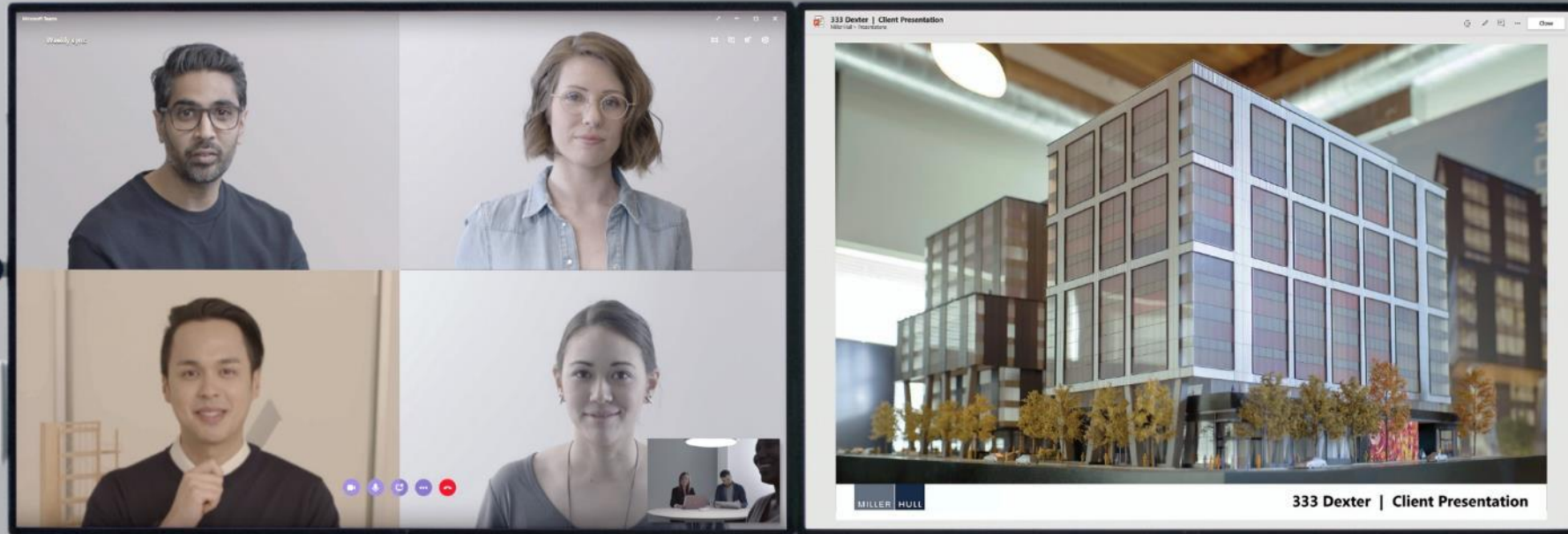
total=1000000
model=777
filter=1234

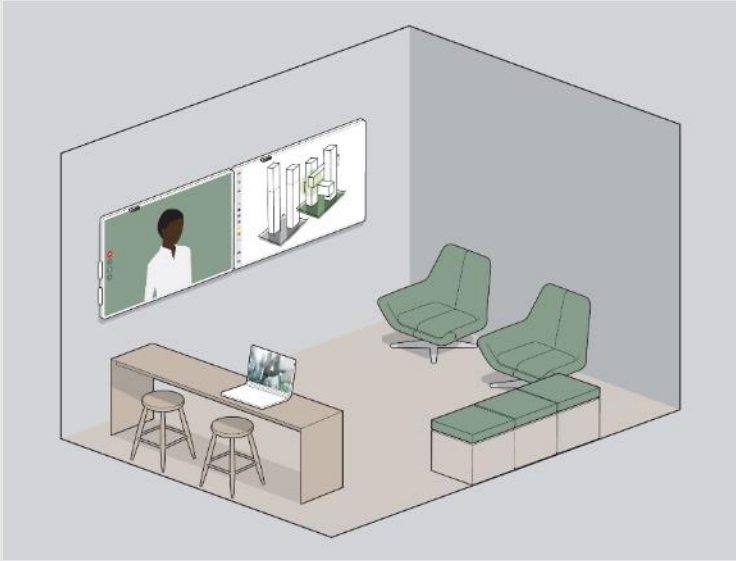


Today – Surface Hub2

Modularity and Tile-ability:
Turn any space in to a teamwork space

For your conference rooms

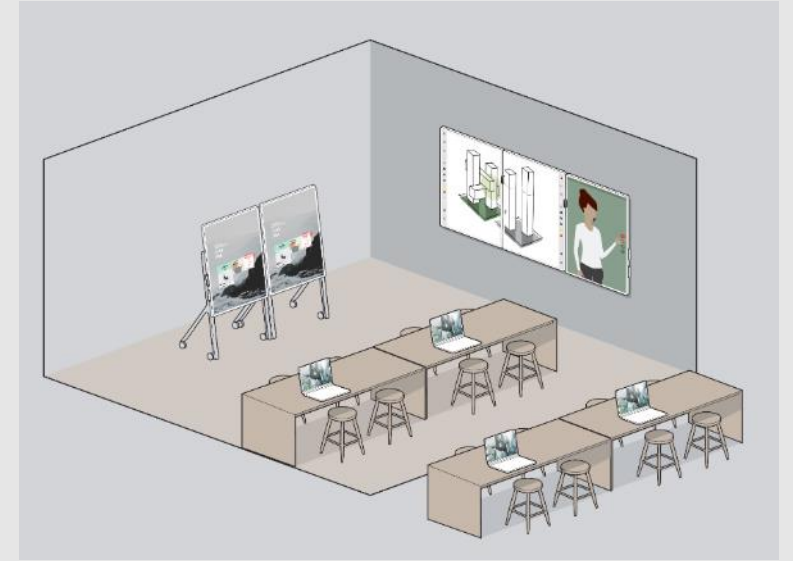




Medium Meeting Space

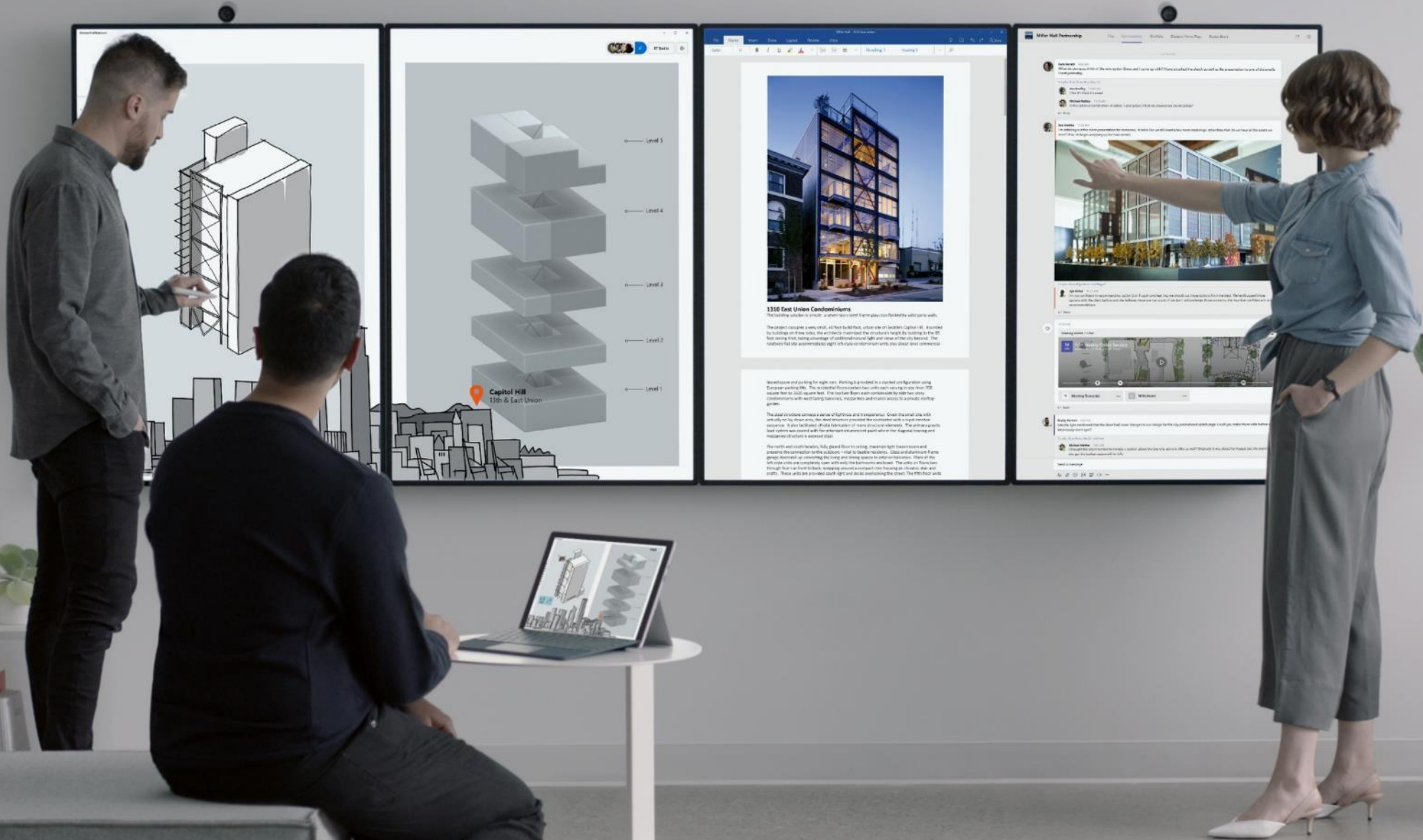


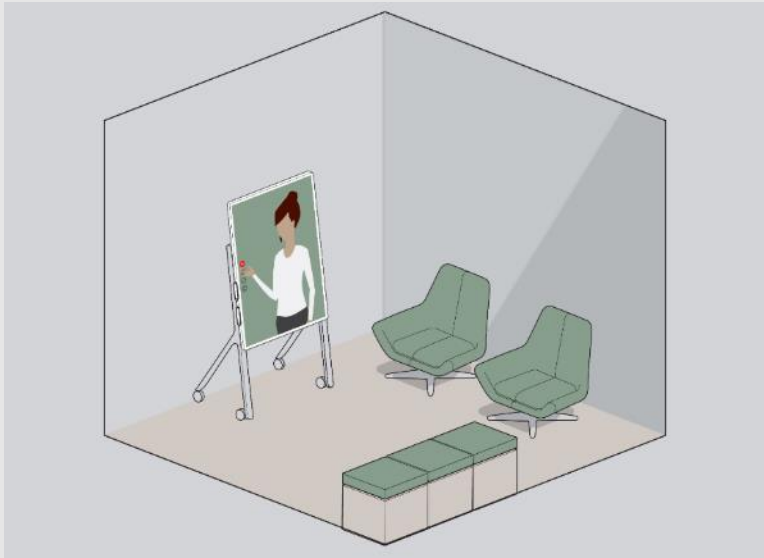
Medium and Large
Conference Rooms



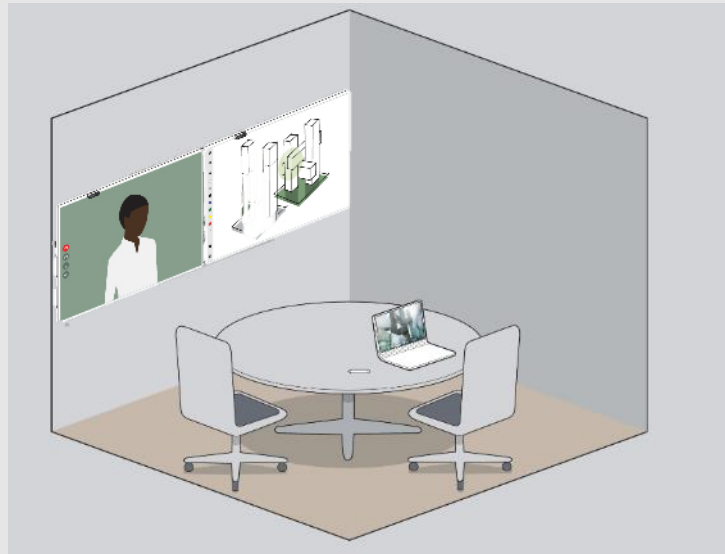
Education, Training,
and Project Rooms

For your team spaces

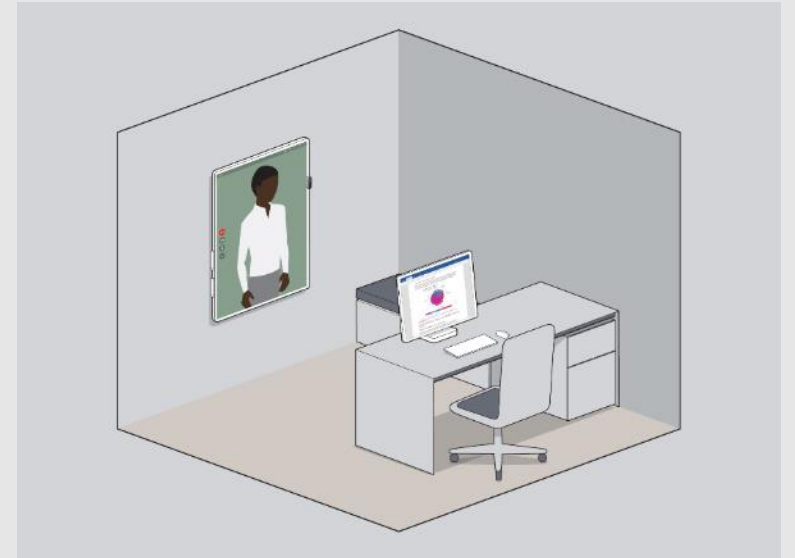




Open Huddle Space



Focus Room



Personal Office

For any space



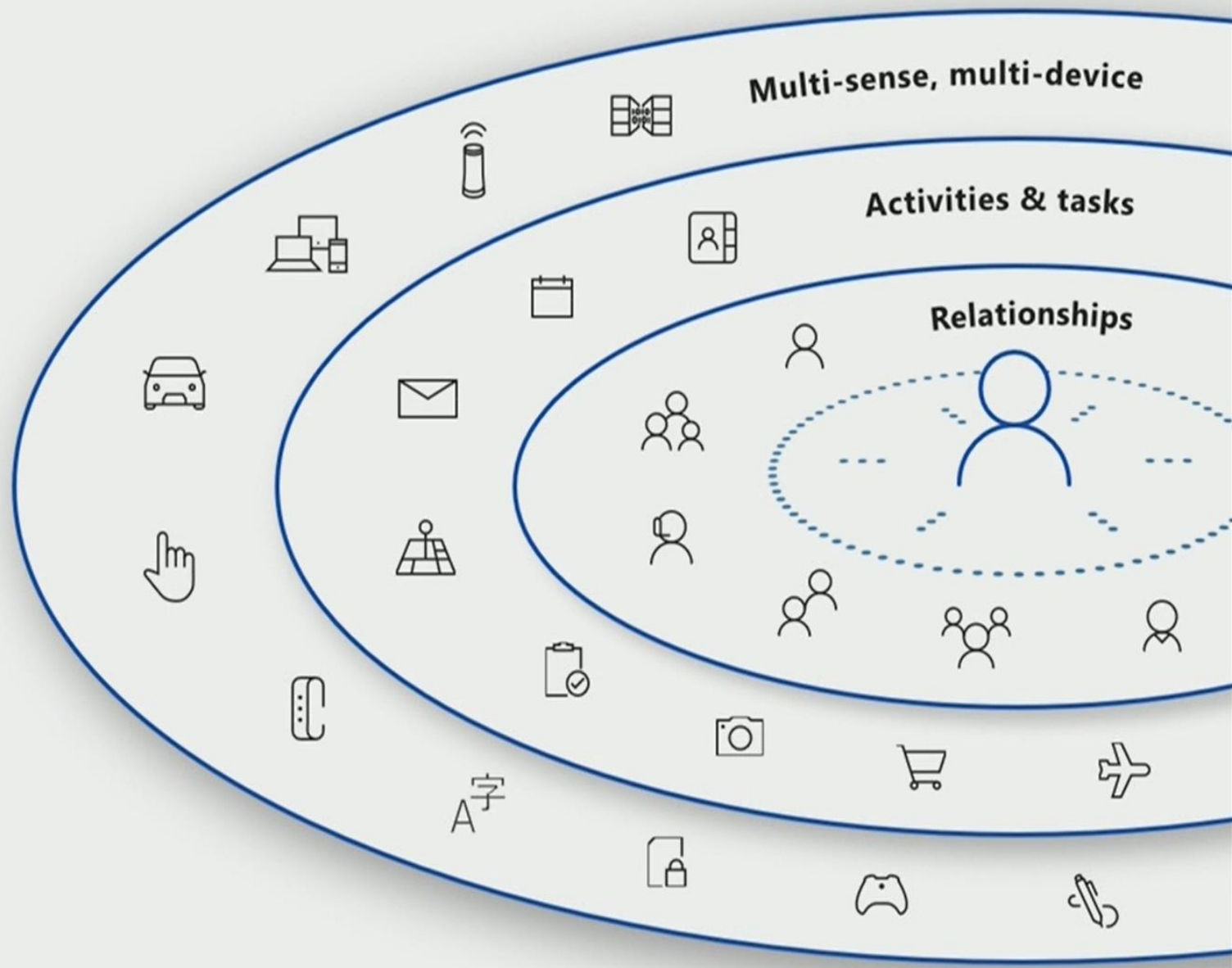


People-centered experiences

Gaming

Microsoft 365

Dynamics 365



Today's teleconferencing

“All humans crave eye contact and respond to it in significant ways, which results in richer communication experiences and helps build trust.”

The screenshot displays a teleconferencing application interface. On the left, a 'PARTICIPANTS' panel lists six presenters: Anne Wallace, David Longmuir, Fabrice Canel, Garth Fort, Rob Young, and Sara Davis. Below this is a 'CONVERSATION' chat window with messages from Sara Davis: 'Sure, give me a second Let me know what you think' and 'That is perfect. I love the way you designed it ⭐⭐⭐⭐⭐'. The main area shows a presentation slide titled 'Why Contoso Case Studies' featuring a line graph of 'TV Sales Increase 2012 - 2015'. The graph compares 'Pre-engagement' (dashed line) and 'Post-engagement' (solid line) sales. A callout for April 2014 shows a sales figure of 38.2 Million and a 15.6% increase in sales post-engagement. The interface also includes a video gallery at the top with six participants, a 'Request Control' and 'Actual Size' menu, and a Windows taskbar at the bottom showing the time as 6:35 PM on 2/23/2015.

- Document centric.
- Very little to no social cues
- Wrong Scale
- No real eye gaze
- People face the wrong direction
- No true integration of interactivity



Sydney



Mumbai

17

17 FEB 2018

TODAY

- 8:30 Art
- 10:00 Recess
- 10:30 Math
- 12:00 Lunch
- 1:00 Language Arts
- 2:30 Dismissal

1:00 PM

SOCIAL STUDIES

er, ir, ur

MISSAL



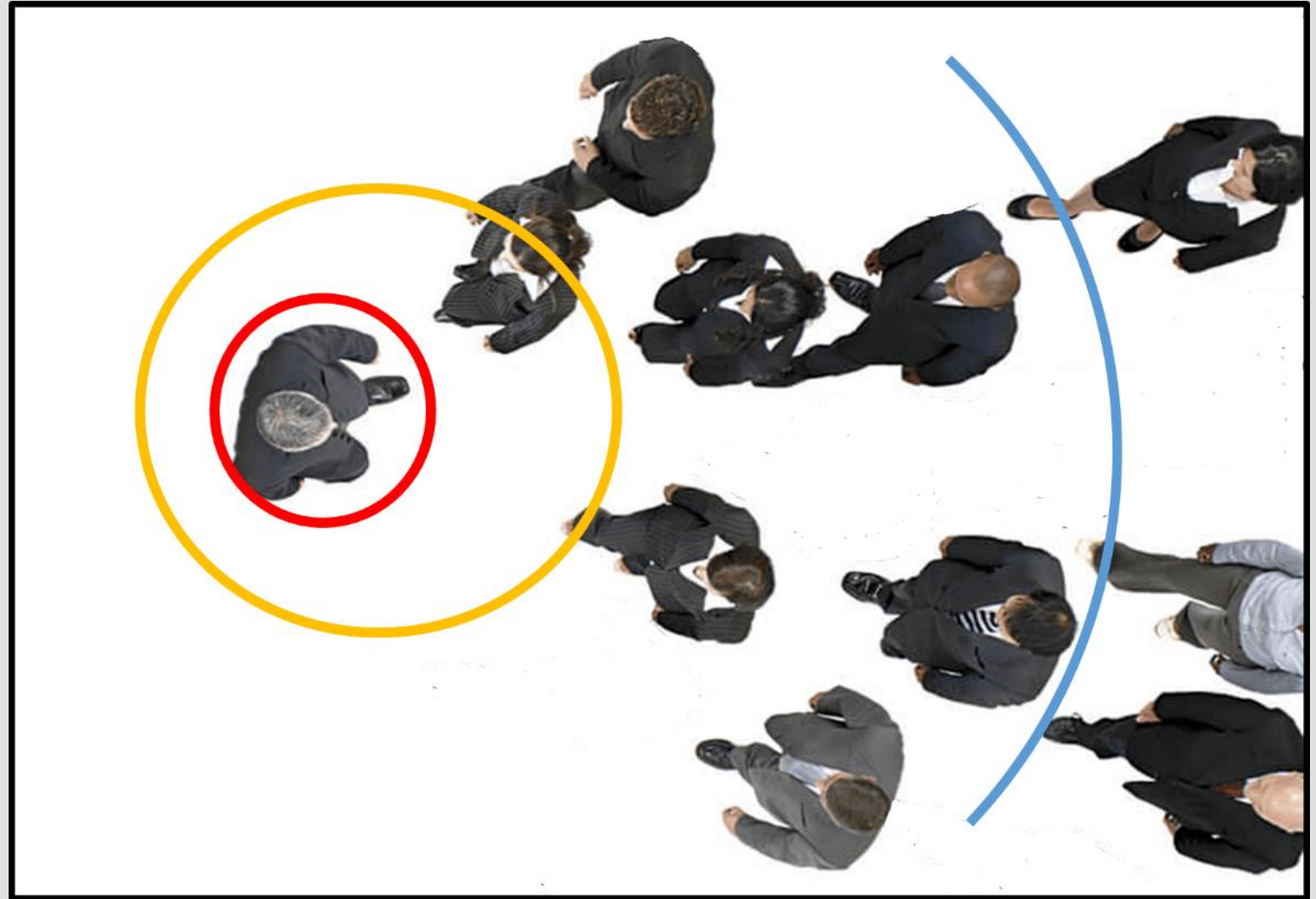
Learnings from the Social Sciences

Human to Human Interaction

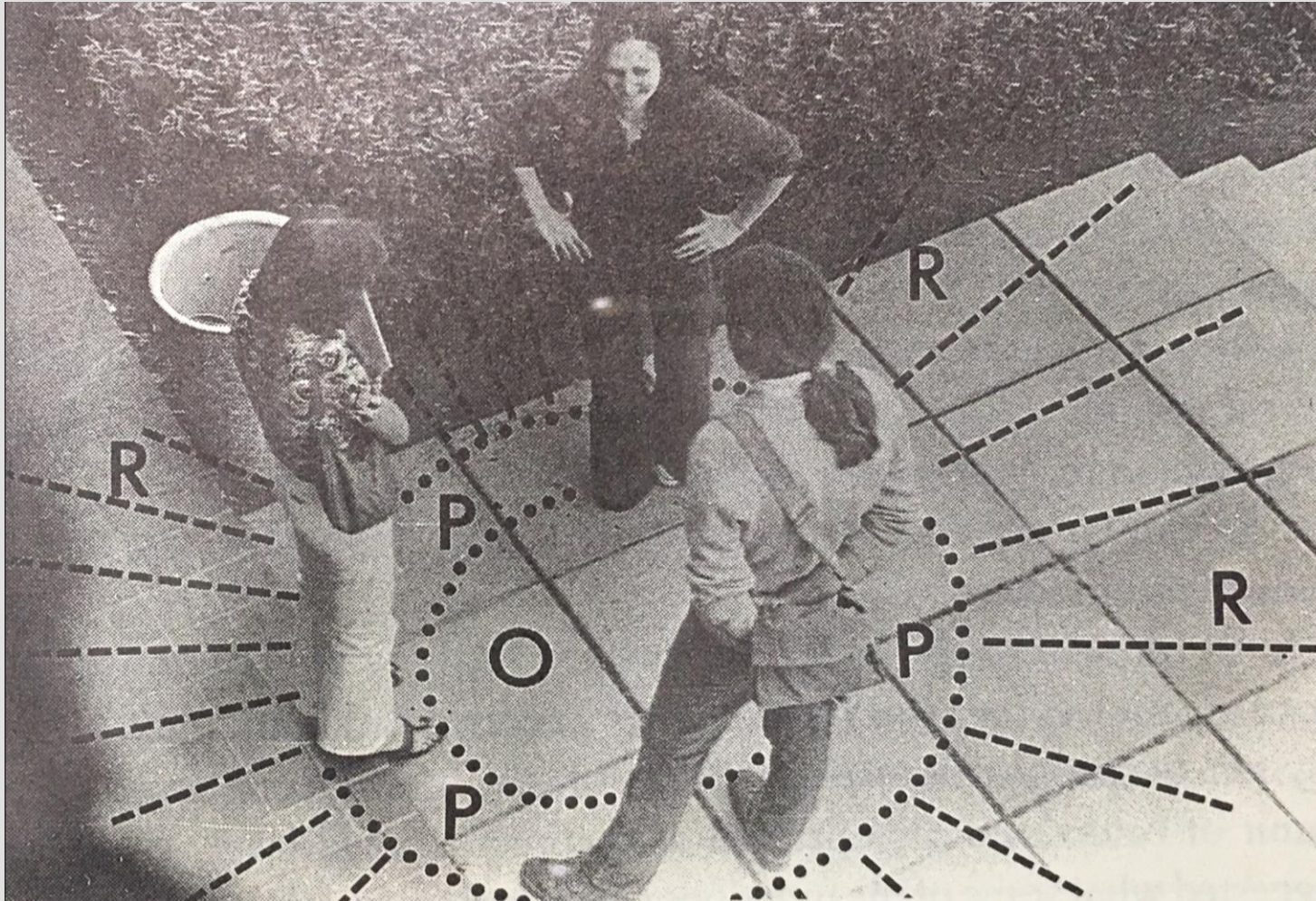
- “The Look” – *Ancient Sumeria*
- Edward T Hall – *The Hidden Dimension*
- Adam Kendon – *Conducting Interaction*
- Bill Buxton – *The Ontario Telepresence Project*

The Distance Effect

Proxemics



Intimate, Personal, Social and Public spaces



Conducting Interaction, Adam Kendon ©Cambridge University Press

"An F-formation arises whenever two or more people sustain a spatial and orientational relationship in which the space between them is one to which they have equal, direct, and exclusive access." [Kendon, 1990]

Interaction spaces

Recreating spatial awareness

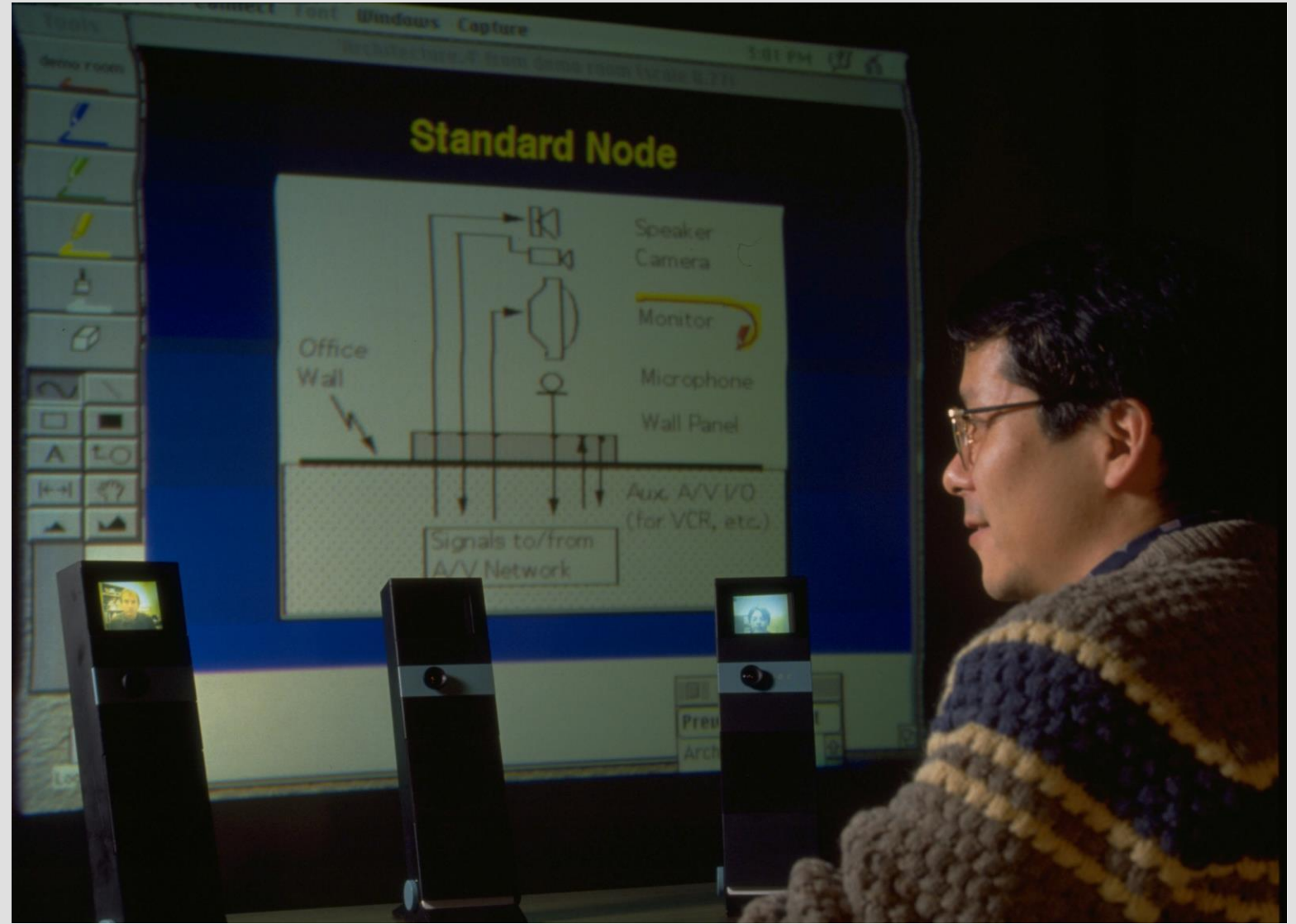


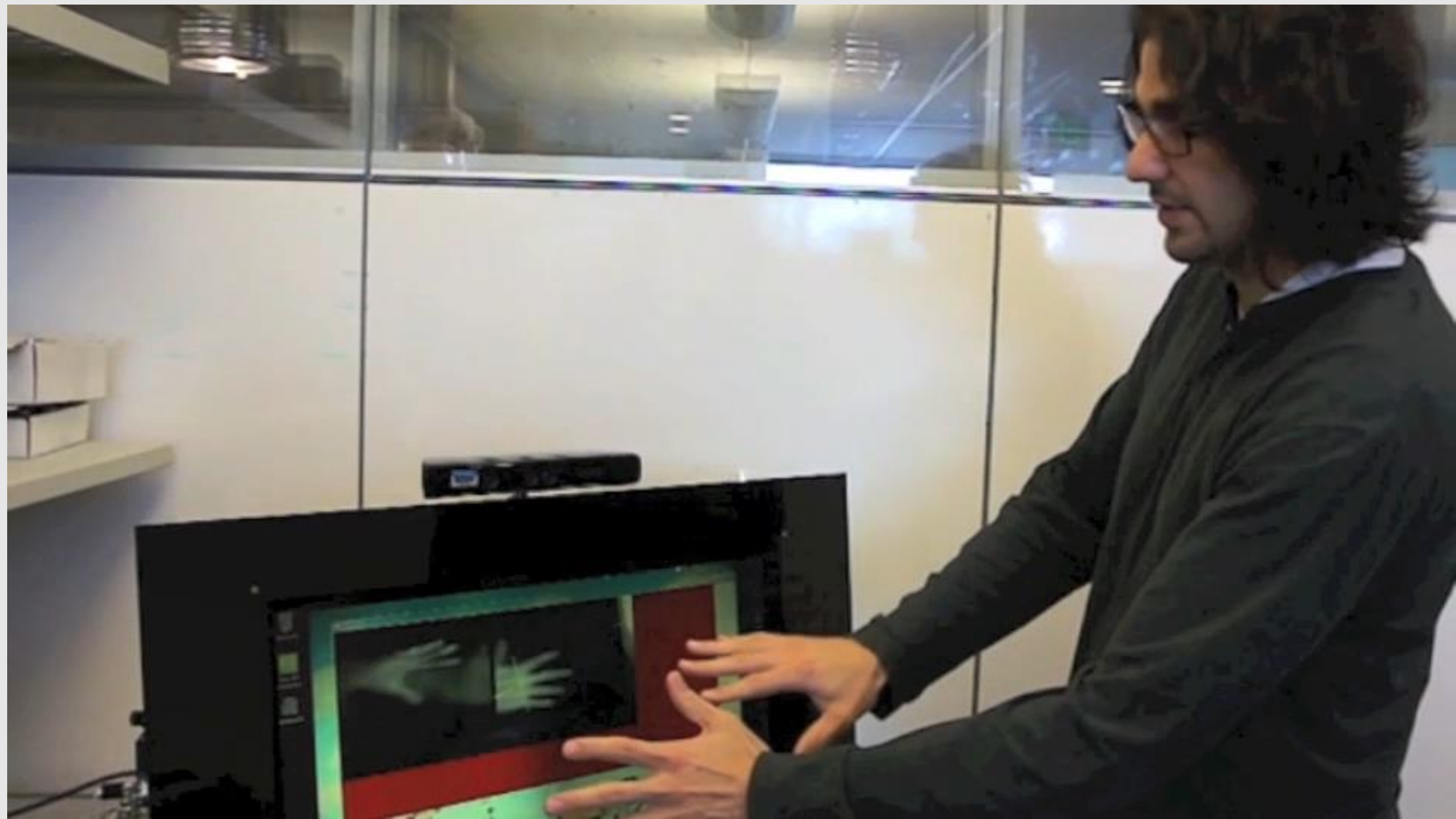
Image courtesy of Bill Buxton

Past Research – Wedge Imaging

Clockwise from top left:

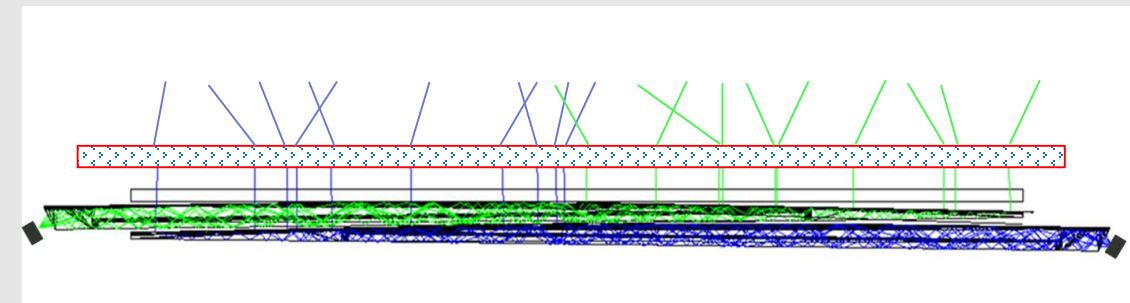
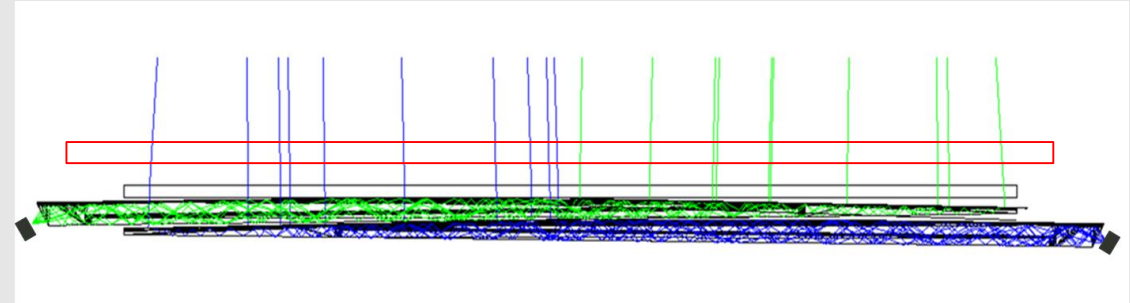
1. Compact optical system
2. Off-screen imaging
3. Arbitrary number of pressure sense points
4. Drawing on screen
5. Pinch and float 3D interaction





Sensing and display

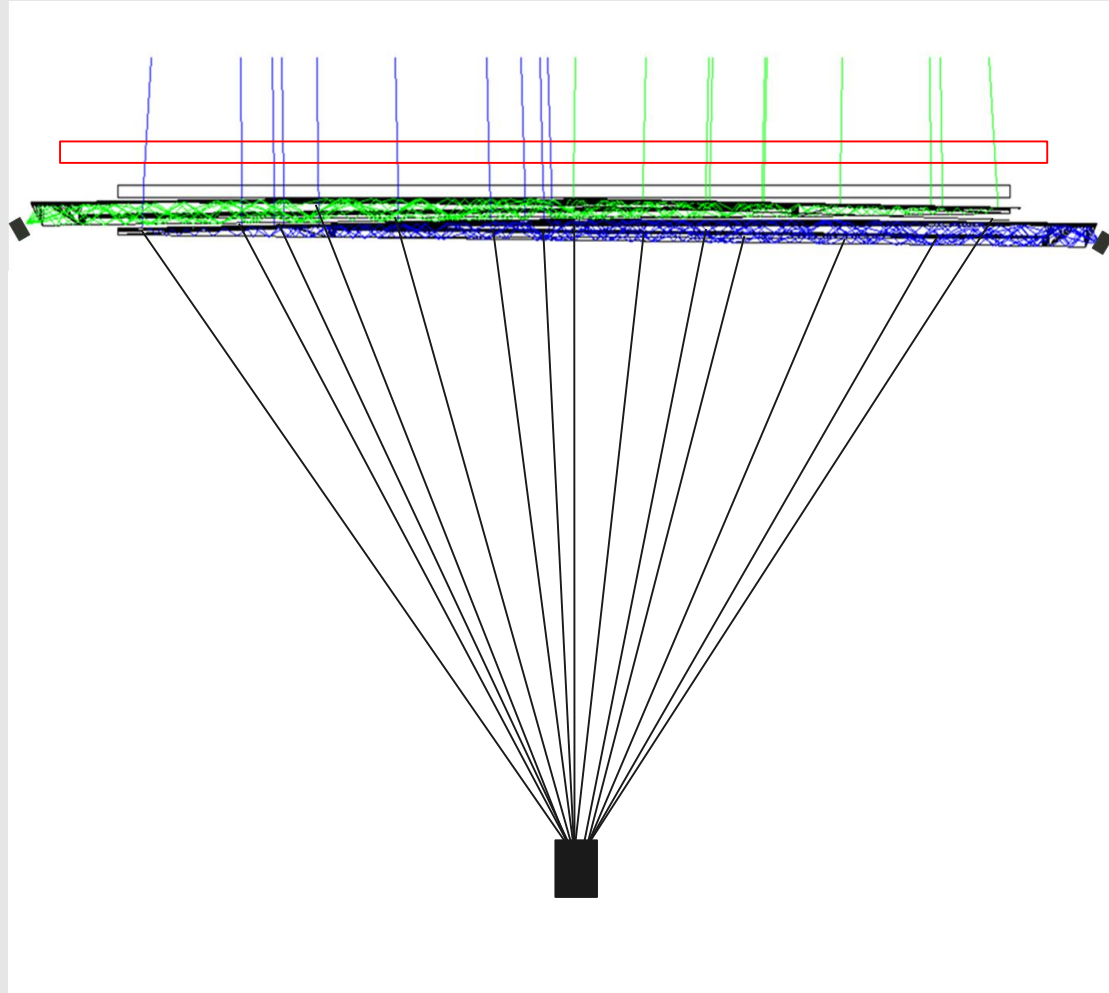
- Using Wedge panels to both illuminate an LCD, and see out, we have the start of an interactive display.
- Since the illumination LEDs are very bright, they must be turned off when the camera is on.
- To stop the user from seeing into the internal structure, a high-speed polymer disperse liquid crystal (PDLC) sheet is used.





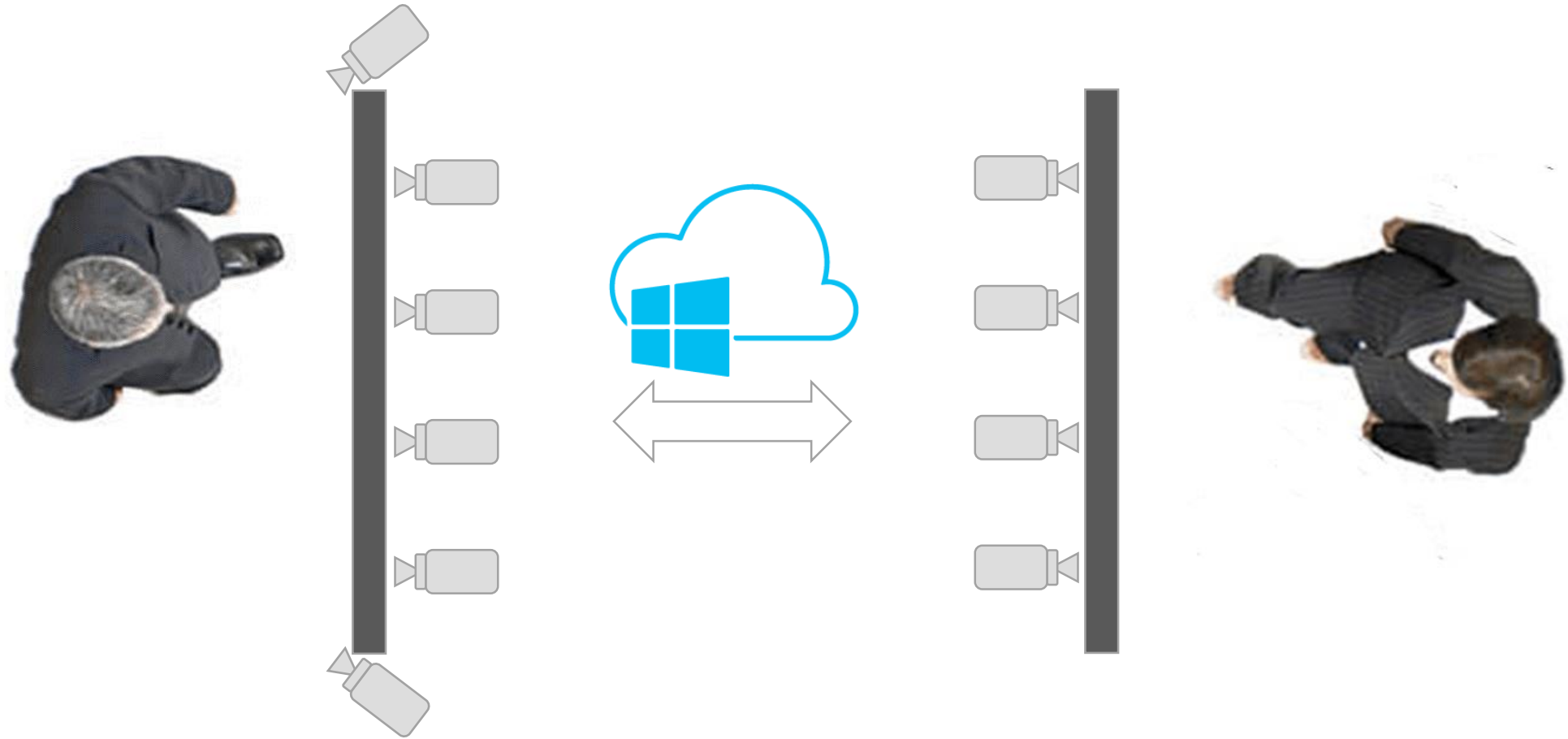
Wedge camera seeing through a display

What's the real value





Improving remote interaction using transparent display



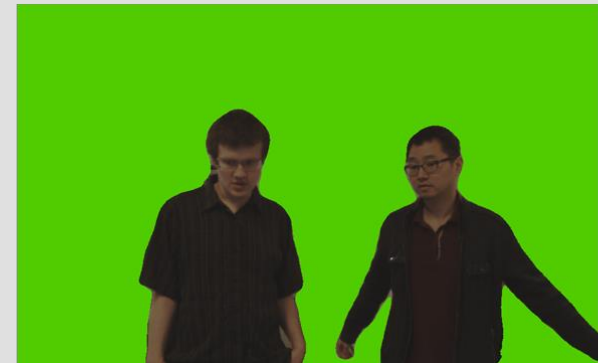
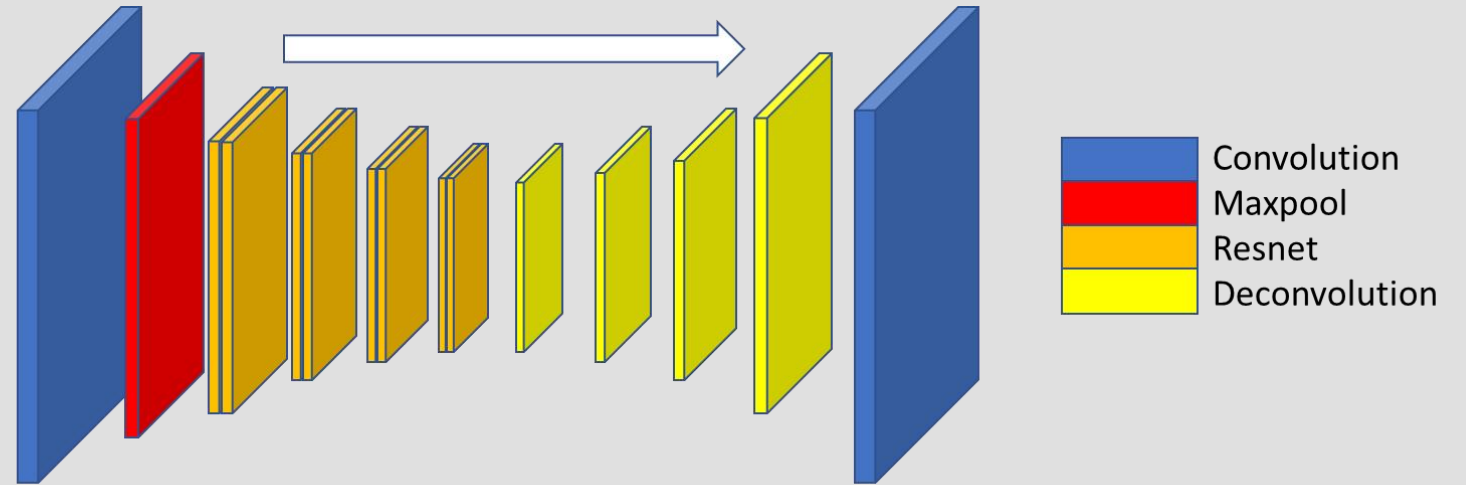




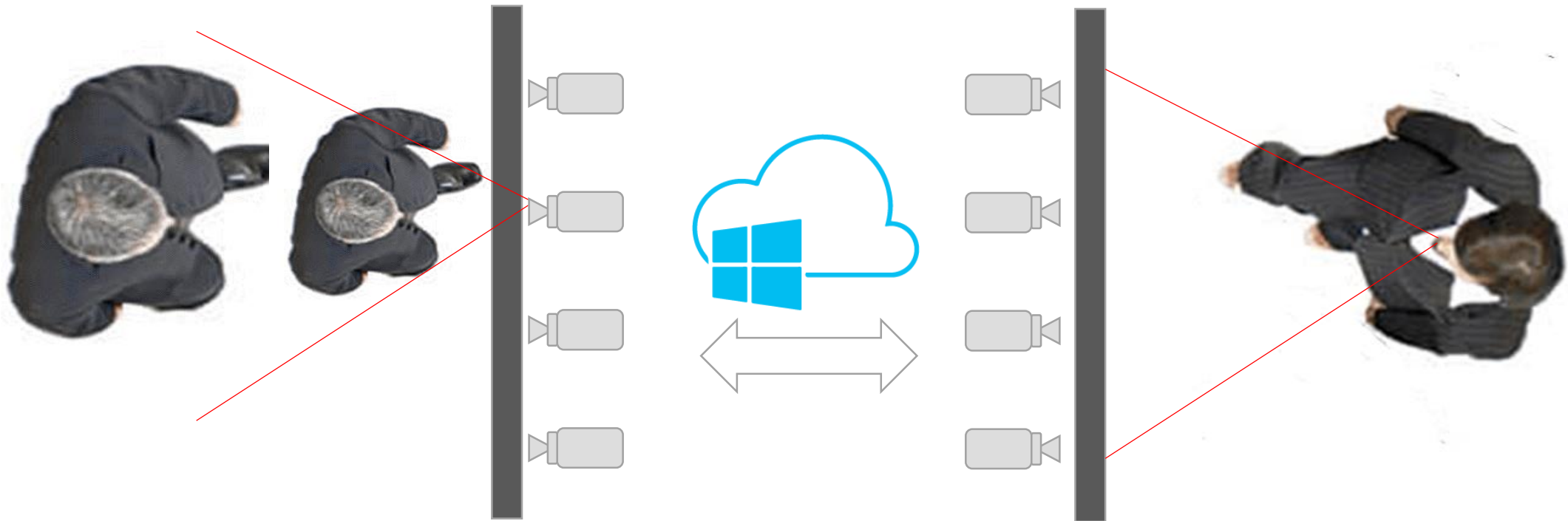


Segmentation

- Deep neural network semantic segmentation finds all people
- Depth segmentation finds correct person



Segmentation and depth sensing for right sizing



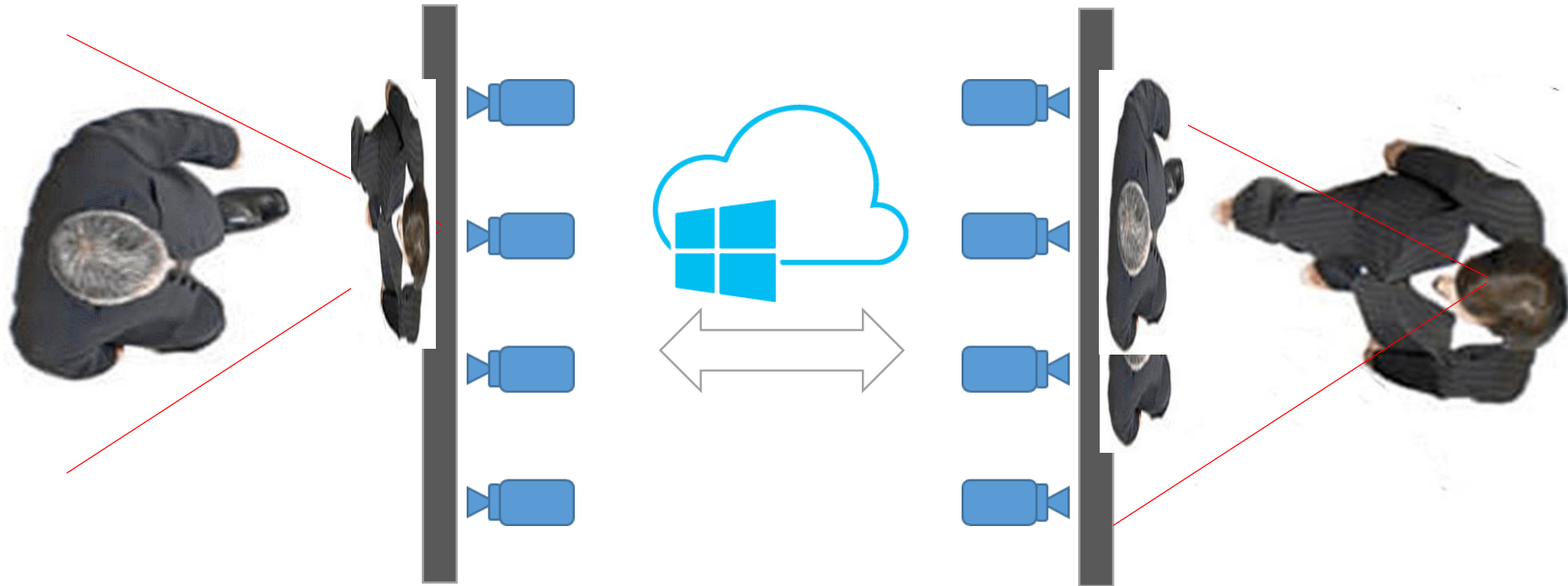
Camera to display converts a subtended angle to width

We want the person to stay the same width so we scale him with distance

Segmentation and Correcting Size/Scale

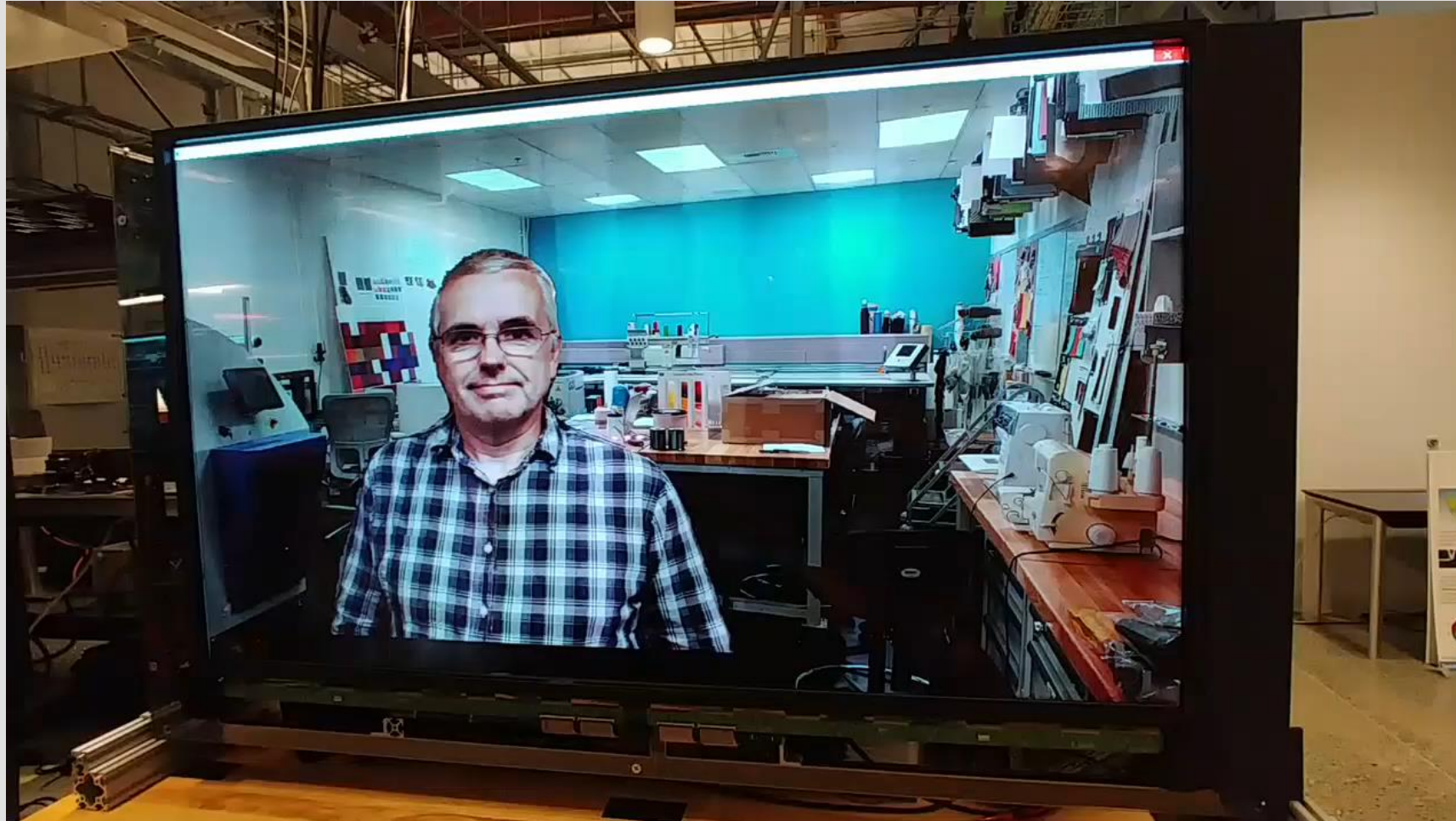


Foreground manipulation allows gaze awareness



If the faces of both participants are centered over cameras, they see each other eye to eye

Gaze Correction



Wormhole

- Personal space - gaze correction
- Social/public spaces “broadcast”
- F-spaces using three cameras

