MOPIC

Most Immersively Yours

Intro

"Major Technology firms focusing on devices that connect people, and reality with the virtual world"

Google

We'll be able to feel present, like we're right there with people, no matter how far apart we actually are. We'll be able to express ourselves in new, joyful, completely immersive ways.

Meta

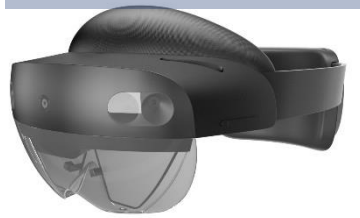
People love being together — to share, collaborate and connect. And this past year, with limited travel and increased remote work, being together has never felt more important. Through the years, we've built products to help **people feel more connected.**

HMD (VR)

Microsoft

Reduce downtime, transform your workforce, and build more agile factories. Empower teams to work securely and enhance patient treatment reducing time-to-care. Improve learning results and revolutionize curriculum with hands on lesson plans that convey complex concepts in 3D.

AR Glass (XR)



MOST IMMERSIVELY YOURS

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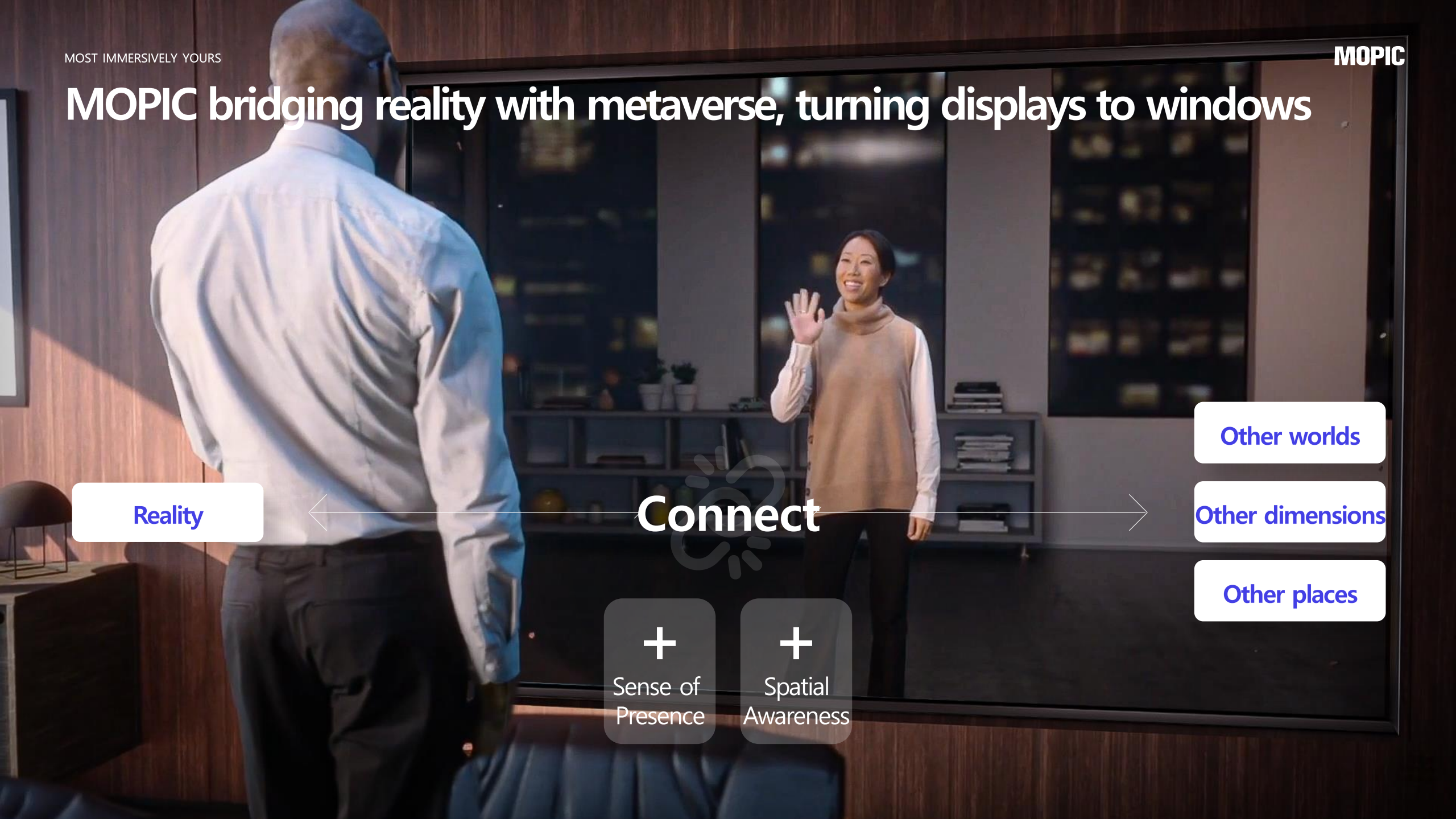
MOPIC bridging reality with metaverse, turning displays to windows



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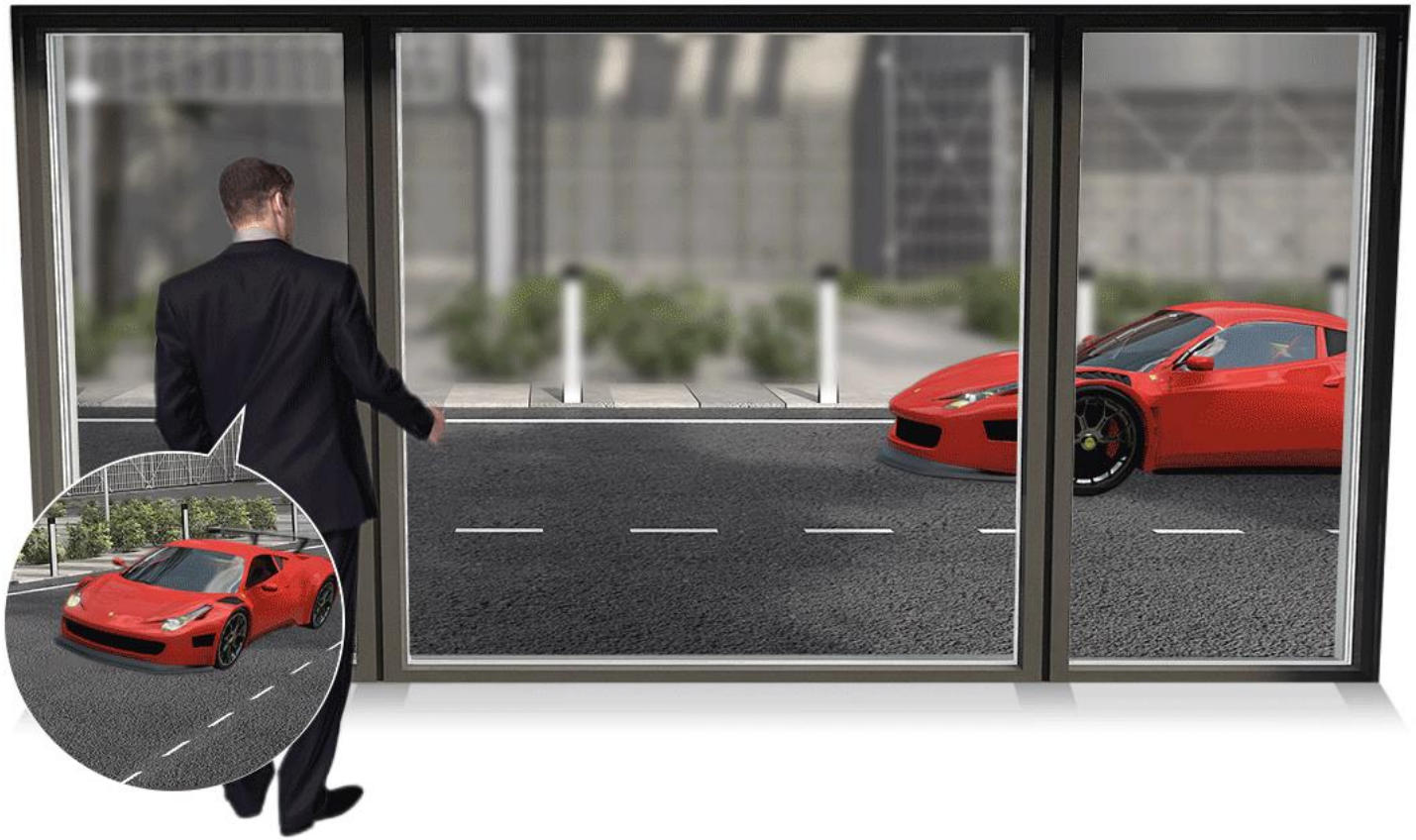
Technology for Sense of Presence

- What we see hinges on physical orientations and locations, due to parallax, i.e. 3D volume. **MOPIC's light field 3D display incorporates real-world parallax into 2D display.**

▶ Play Video



When we want to see a Porsche 911 out the window disappearing quickly to the left, we intuitively move to the right to follow the car.

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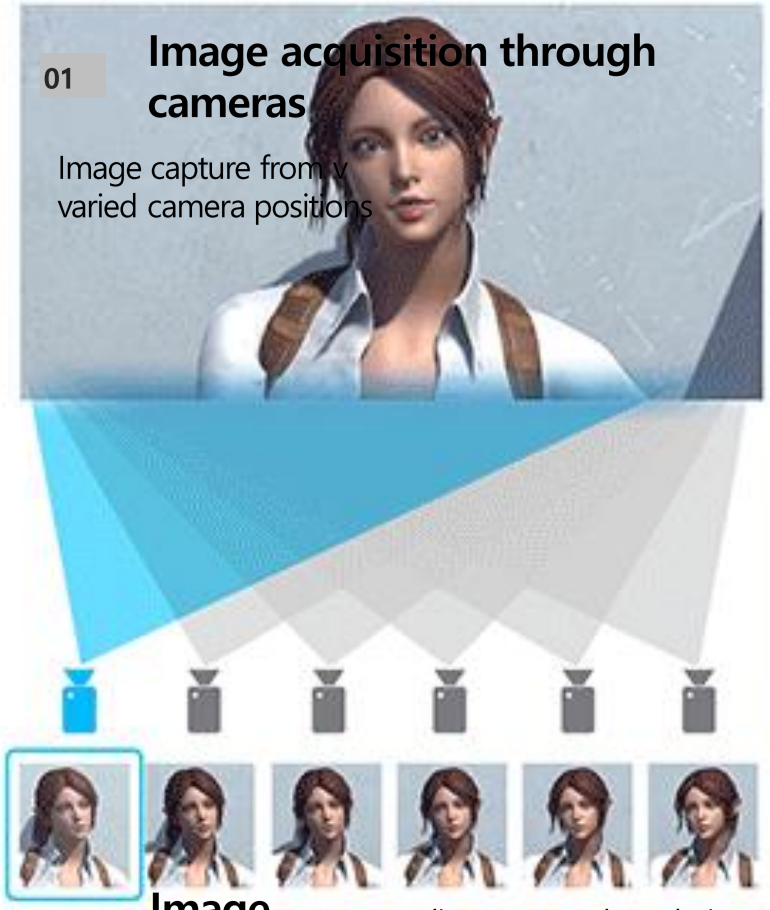
Technology for Sense of Presence

Light field 3D display shows images corresponding to viewing positions such that real world parallax, i.e. 3D volume is actualized, as if there were a real object within the display. The smartphone below shows images corresponding to viewing positions.



01 **Image acquisition through cameras**

Image capture from various varied camera positions

02 **Image Optimization**

Image alignment and rendering

03 **Image (PC)**

Image display at once

Light field 3D display

▶ Play Video

04 **Light field 3D display output**

Images according to viewing positions through 3D lens applied to 2D display & light vector control at subpixel level

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Technology for Spatial Awareness

- Glasses-free binocular disparity, i.e. 3D depth, is made possible, with viewing positions reflected. Images for left and right eyes are displayed at once, which, combined with real-time eye-tracking, are controlled precisely for corresponding eyes.

Pre-compensation for eye positions, different images for each eye

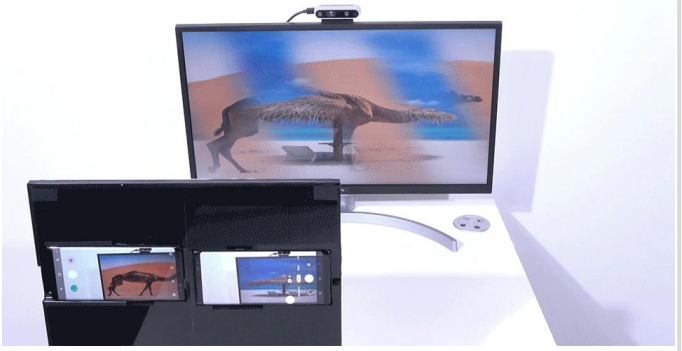
▶Play Video

Eye-tracking

▶Play Video

Post-compensation for eye positions, identical images for each eye

▶Play Video



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Technology for Spatial Awareness

- Interactions are added by coupling virtual camera positions with viewing positions, while images for left and right eyes are displayed at once for binocular disparity, i.e. 3D depth. The result is the creation of another world, deep within the display.

STEP 1 — **Eye-tracking**
Locating eyes through the eye-tracking camera

STEP 2 — **Coupling virtual cameras**
Coupling eye positions with virtual cameras

STEP 3 — **Displaying 3D images real-time**
Delivering 3D images according to eye positions real-time

STEP 4 — **Playing via light field 3D display**
Playing 3D images via light field 3D display with no HMD or 3D goggles

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Competitive Strengths

- Light field 3D displays' core technologies pertain to low cross-talk, eye-tracking capability, high 3D resolution and luminance, all of which MOPIC possesses.

01 High 3D Resolution

Retention of 2D display resolution for 70%+ and luminance for 90%+

- Design and use of 3D lens pitch to retain maximum 2D display resolution
- Arrays of convex lenses that collect light rays for minimum light loss

02 Best-in-class 3D Image

Super low cross-talk (less than 2%)

- Technology developments to direct light rays to desired directions
- 3D images that are smooth and easy on the eyes via MOPIC shader

03 Eye-tracking Capability

Ultra low latency (5ms) Deep-learning based high accuracy

- Consistent delivery of optimal 3D images corresponding to viewing positions
- Eye-tracking frequency of 90 times per second

04 Precision Optical Design

- **Field of View (FoV)**
- **# of views**
- **Optimal viewing distance**

- Accurate outcome prediction made possible by accumulated knowledge and experience, as well as multi-faceted review
- Reliable results produced via simulations, testing equipment and tools in lab settings

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Areas of Application

Video Conferencing System & Remote Control and Monitoring System

System

- 3D Cameras
- Web Service (WIP)
- 3D Display

Function

Multi-view Image Acquisition + Real-time + Eye-tracking

Value Add

Making people feel like they are in the same room or in the field in situations where they cannot be together or out in the field

Metaverse, Gaming & Entertainment etc.

System

- MOPIC API
- Mirroring Software
- 3D Display

Function

Virtual Camera Coupling with Eye-tracking + Real-time + 3D Depth auto-adjustment

Value Add

Adds sense of presence & spatial awareness to metaverse & gaming content

Smart Signage

System

- Content Creator
- Web Service (WIP)
- 3D Display

Function

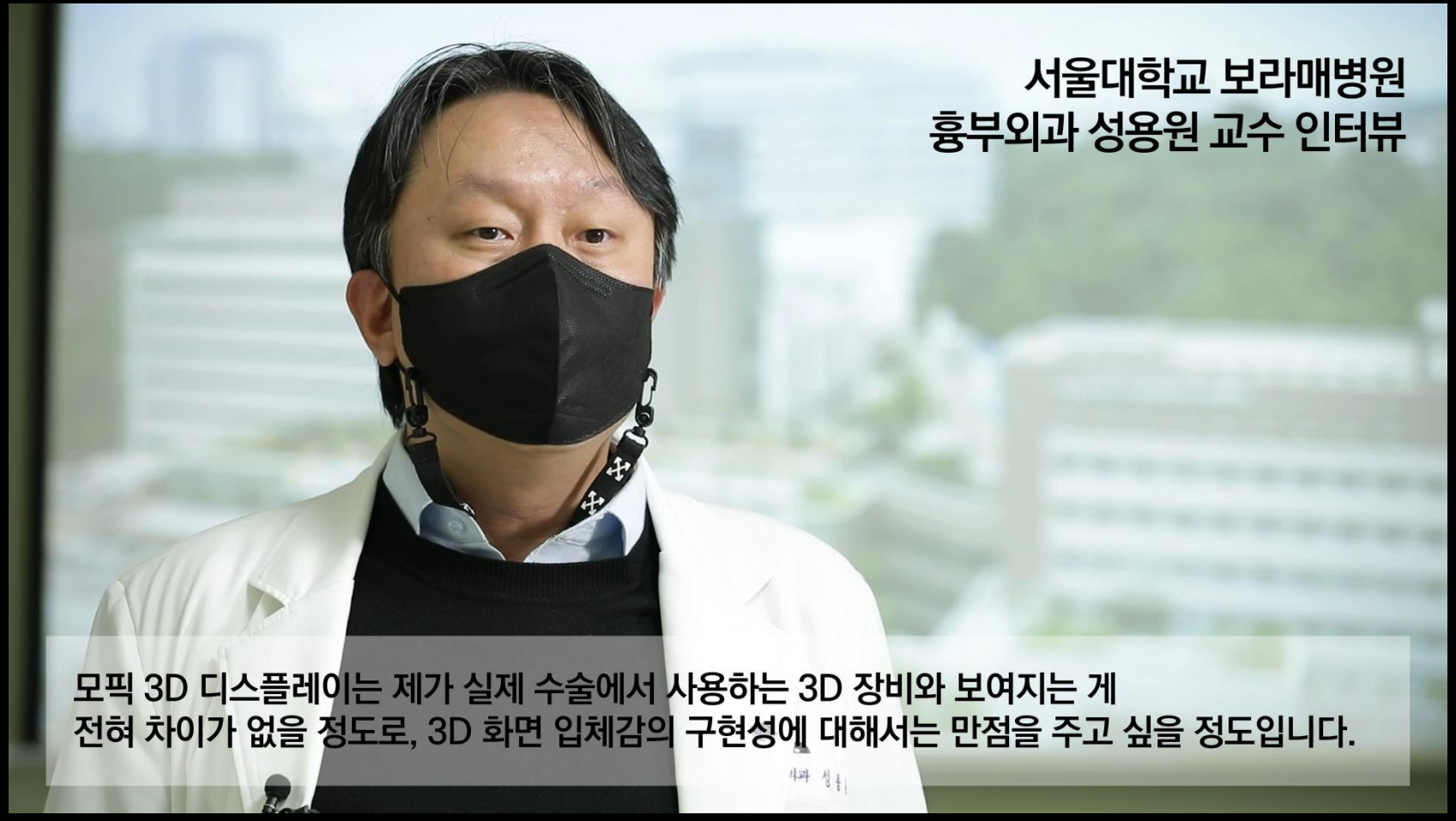
Multi-view + Airtouch Interaction + Eye-tracking

Value Add

Draws attention more easily for longer while providing visually immersive experiences

Customer Interview

Professor Yongwon Sung, Thoracic Surgery at Seoul National University Hospital (Specialist)



https://youtu.be/xDaEf6O0olo

Use Case

- Surgical procedures are broadcast live with sense of presence and spatial awareness via MOPIC 3D displays. Areas of application include endoscopy, microscopy and robotic surgery with 5G connectivity for high utilization.

Customer	BARCO, ASENSUS SURGICAL, SNUH
Product	Remote Monitoring System 3D Display w/ an eye-tracking camera & 3D Cameras
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	Work in Progress
Schedule	To be installed at Korea's leading Seoul National University Bundang Hospital by 4Q 2022
Target Market Size	-
Expected Revenue	TBD

Microscopy

Endoscopy

Glasses-free 3D Robotic Surgery

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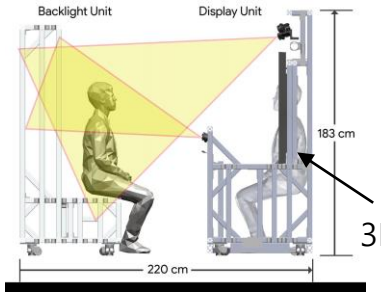
Use Case

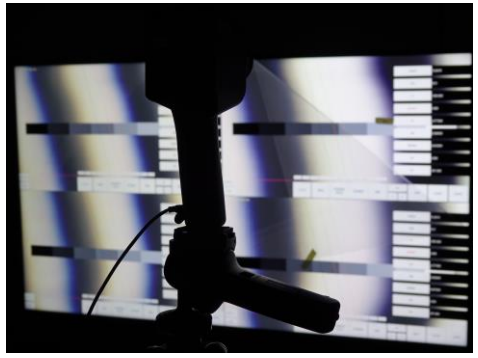
MOPIC designs and manufactures a 3D video conferencing system that offers an experience of an in-person meeting between people remotely located, and this 'magic window', unveiled by customer's CEO publicly, was a culmination of 3 years of successful strategic partnership.

3D Video Conferencing System	
Customer	Major technology firm in the US
Product	65" 8K 3D Display
Manufacturing & Production	SW : Firmware only HW : Outsourcing
Status	5th Batch of 3D Displays Contract amount of US$1M+ in 2021
Schedule	Development contract in 2020 Pre-production in 2023
Target Market Size	US$250M/year
Expected Revenue	US$100M/year

3D Video Conferencing Demo



3D Video Conferencing System



3D Functional Test

Miscellaneous Test & Inspection

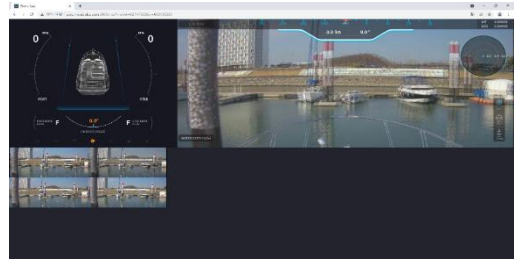
Use Case

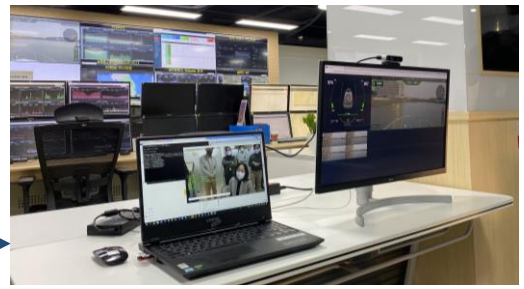
MOPIC designs and offers a 3D remote monitoring system. 3D cameras capture images out in the field, which are transmitted via 5G network to a remote 3D display that plays the images in real time. HHI and KT are looking to commercialize the system upon the successful field test.

3D Remote Monitoring System	
Customer	HYUNDAI HEAVY INDUSTRIES, kt
Product	Remote Monitoring System 3D Display w/ an eye-tracking camera & 3D Cameras
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	A successful field test at KT control tower in Gwacheon as well as on Ara canal
Schedule	Under Discussion
Target Market Size	US$115M/year
Expected Revenue	TBD

Lightfield 3D Cameras :
3D Capture out in Field

5G





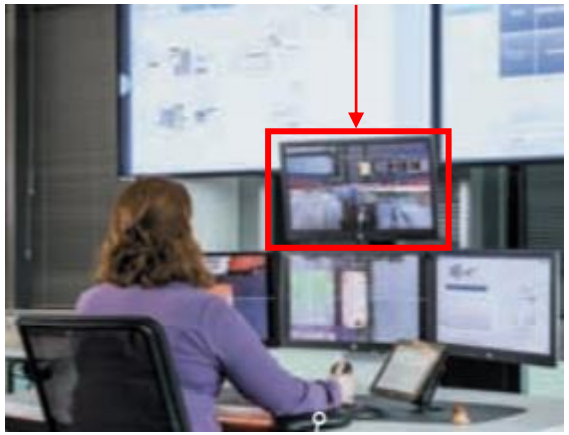
Lightfield 3D Display:
3D Display for Remote Access

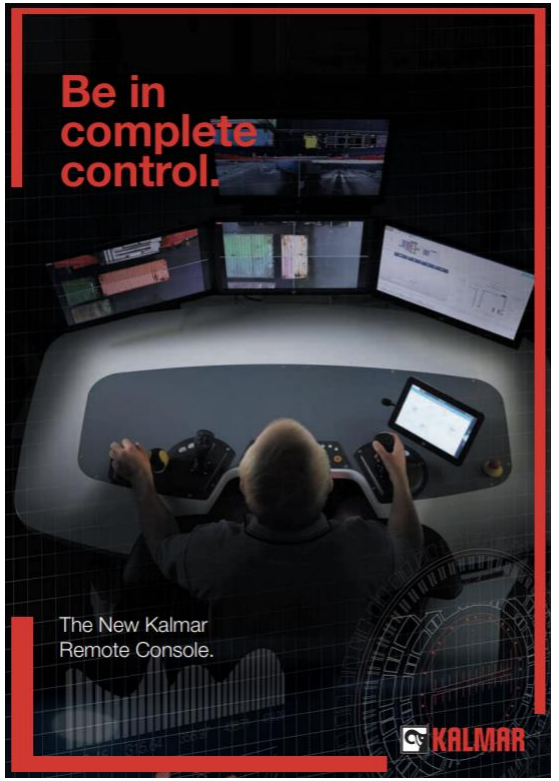
Use Case

- Kalmar, Finland's cargo handling equipment manufacturer, offers a 2D remote control system, and plans to convert it to a 3D remote control system, upon a successful field test.

3D Remote Monitoring System	
Customer	elisa KALMAR
Product	Remote Monitoring System 3D Display w/ an eye-tracking camera & 3D Cameras
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	Work in Progress
Schedule	Under Discussion
Target Market Size	US$115M/year
Expected Revenue	TBD

A potential 3D display candidate





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Use Case

- Solectrix, a high-end embedded electronics system provider in Germany, added MOPIC's 15.6" 3D display as part of its system products. Solectrix placed a 100 unit order for 2022 and 500 for 2023.

3D Display	
Customer	solectrix high end electronics solutions
Product	3D Display w/ an eye-tracking camera
Manufacturing & Production	SW : In-House HW : Outsourcing
Status	Low Volume Production of 100 Units in 2022 & 500 units in 2023
Schedule	3Q 2022
Target Market Size	US$130M/year
Expected Revenue	TBD

MOPIC 3D Display

Solectrix product brochure

Use Case

- Daimler is studying MOPIC's 3D display technologies for instrument panel use while BMW is looking into HUD, instrument panel, and infotainment system incorporation. Airbus is also studying MOPIC's 3D display technologies for aircraft cabin interiors and in-flight entertainment systems (IFSE).

3D Instrument Panel & Infotainment System	
Customer	DAIMLER, BMW, AIRBUS
Product	3D Lens, An Eye-tracking Camera & API
Manufacturing & Production	SW : In-House HW : Outsourcing
Status	Work in Progress
Schedule	Under Discussion
Target Market Size	US$570M/year
Expected Revenue	TBD

Samples provided to Daimler

Use Case Scenario

Use Case Scenario

Use Case

- MOPIC's 3D smart signage systems installed at Westfield Glories premier shopping mall and Antoni Gaudi's UNESCO World Heritage site, Casa Batllo have garnered visitors' attention and interest that led to project extension and potential expansion. MOPIC's 3D smart signage systems draw attention more easily for longer and offers a unique experience to viewers.

3D Smart Signage	
Customer	Westfield GLÒRIES / CASA BATLLÓ GAUDÍ BARCELONA
Product	26.5" & 43" 3D Smart Signage System
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	Installed & Operational
Schedule	Under Discussion for Expansion
Target Market Size	US$380M/year
Expected Revenue	TBD

https://youtu.be/MEOSFBOT1zQ

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Potential Use in Research & Academics

- MOPIC 3D displays provides spatial awareness with 3D depth and volume in real time, thereby offering educational benefits.

Customer	고려대학교 KOREA UNIVERSITY / ETRI 한국전자통신연구원
Product	3D Display w/ an eye-tracking camera
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	-
Schedule	-
Target Market Size	-
Expected Revenue	TBD

As is with Pluraview

- 2x 4K Displays
- Polarized 3D Glasses
- Expensive (c. US$20K+)

MOPIC 3D Molecular Visualization System Demo

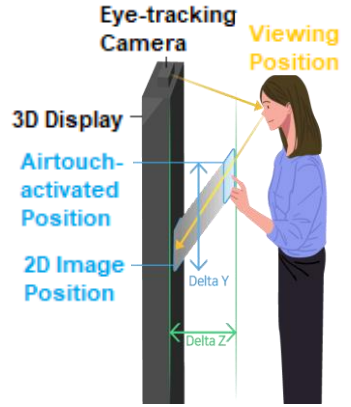
- ✓ **1x 4K 3D Display**
- ✓ **1x Eye-tracking Camera**
- ✓ **Glasses-free**
- ✓ **Cost-efficient (approx. by an order of magnitude)**

* 3D molecular visualization system provides 3D depth and volume

Potential Use in Retail & Advertising

- Useability improves with an alignment of spatial coordinates for airtouch and 3D images. MOPIC-patented algorithm corrects errors owing to touch coordinates by taking into account user's viewing positions.

Customer	DYCIS 신세계 아이앤씨
Product	3D Display w/ an eye-tracking camera & Infrared Sensor
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	1st Sample Ready
Schedule	3Q 2022
Target Market Size	-
Expected Revenue	TBD



Alignment of Spatial Coordinates for Airtouch & 3D Images

Demo

Potential Use in Metaverse and Gaming & Entertainment

- 3D graphics-based games are a plug and play on MOPIC 3D displays, with no software modification necessary. Users are immersed with games rich in depth and volume.

Customer	XBOX ZWIFT
Product	3D Display w/ an eye-tracking camera
Manufacturing & Production	SW : In-House HW : Outsourcing
Status	Under Discussion
Schedule	-
Target Market Size	-
Expected Revenue	TBD

Demo

Software in the Works

Use Case Scenario

Use Case Scenario

MOPIC

Potential Use in Gaming & Entertainment

- 3D depth and volume for gaming and entertainment industry draw people and offer a fresh visually immersive experience. 3D display technologies, already incorporated into slot machines and pachinko, are expanding in their applications to the industry.

Customer	IGT, SCIENTIFIC GAMES
Product	3D Display
Manufacturing & Production	SW : In-House HW : In-House & Outsourcing
Status	Ready to commercialize
Schedule	-
Target Market Size	-
Expected Revenue	TBD

Glasses-free
3D Slot Machine

3D Video Arcade
with 3D Glasses

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Team MOPIC

CB Shin — Founder & CEO

- Overseeing operations, engineering & product development among others
- Formerly with Samsung Electronics' DMC (Digital Media & Communications) Research Center for 13 years
- Led MOPIC's spin-off from Samsung Electronics via C-Lab (Creative Lab)

KJ Joo — Head of Software Research

- In charge of software and UX/UI development
- Formerly with Tobesoft as Sr. Developer with a 17 year career
- Skilled in UI/UX platform, image processing, QR code scanner, AOI equipment and software development

AR Han — Senior Software Engineer

- In charge of cloud and web backend development
- Formerly with TmaxSoft as Head of Research & Development and a Technical Executive with a 9 year career
- Skilled in AI, fintech, UI/UX platform and operating system development
- MSc in Computer Science from KAIST as well as University of North Carolina at Chapel

Andrew Kwon — Head of Business Development

- In charge of sales, business development & strategy
- Formerly with General Electric (GE) as Sr. Sales Director & a graduate of GE's Experienced Commercial Leadership Program with illustrious outcome with 15+ year career
- BASc in electrical engineering from the University of Toronto, MBA from INSEAD (France) & MA in Global Affairs from Yale

Thank you

www.mopiclabs.com