

LEI | A 3D

# Holographic Reality™

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September 13th, 2016  
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# Holographic Reality

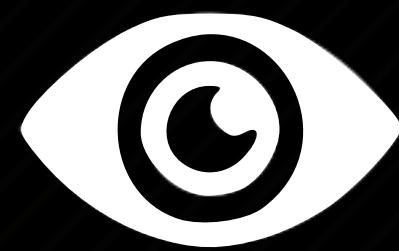
The Virtual World. Materialized.

- Holograms you can manipulate in mid-air
- Compatible with screens of any size
- No eye-wear
- No eye-tracking
- No headaches !

Lightfield display  
(LEIA)

Hover Touch  
(Synaptics, JDI)

UltraSonic Haptic  
(UltraHaptics)



See



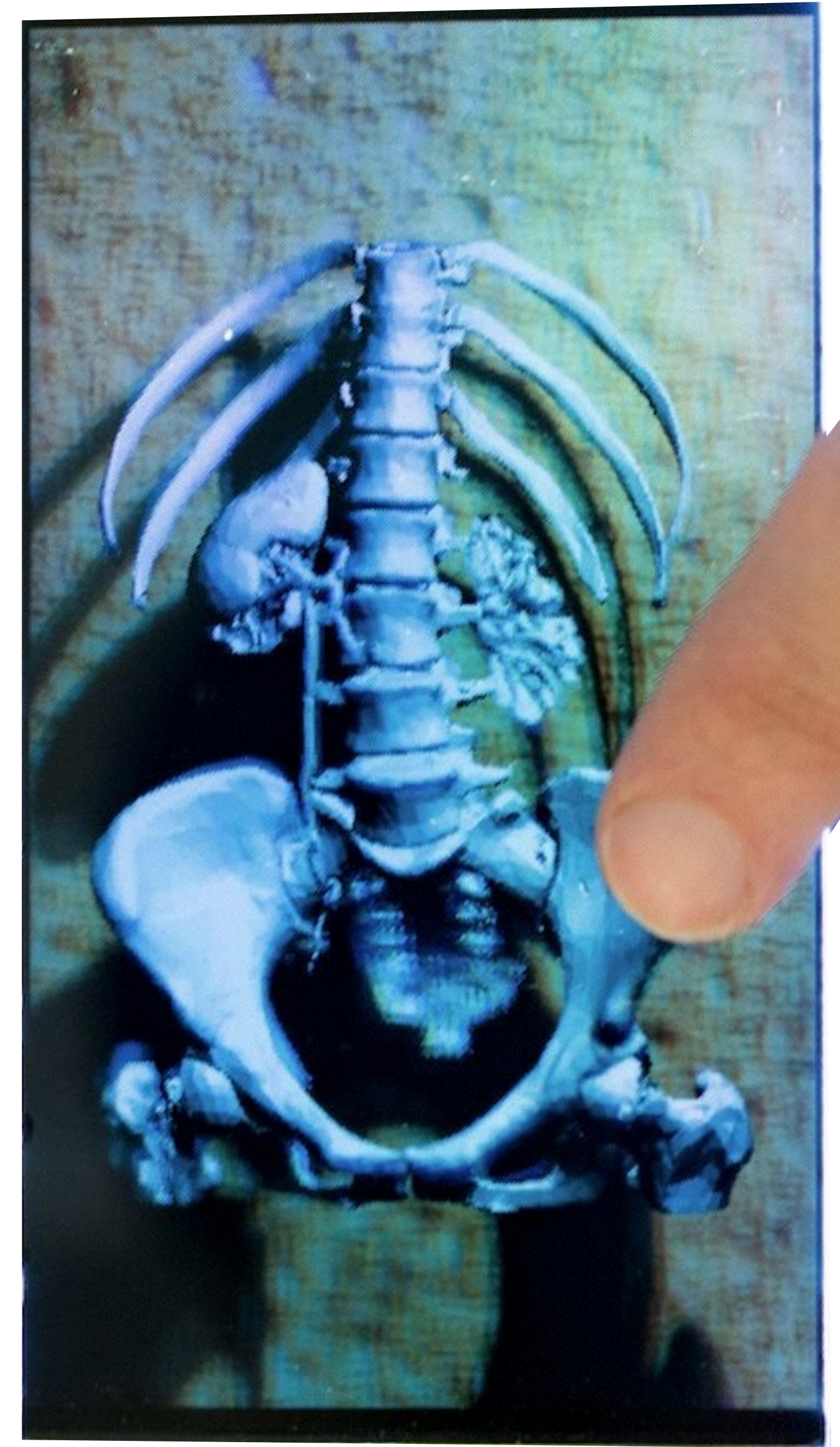
Interact



Touch

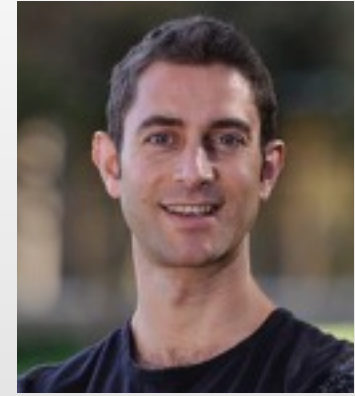
# Company Overview

- Founded Dec 2013 (spin-off HP Labs)
- Series A Feb 2014 — \$25M
- Announced partnership with Altice to bring LEIA powered holographic smartphones to market in 2017
- Currently 35 employees + contractors
- Locations
  - HQ / R&D / Software — Menlo Park, CA
  - Nano-fabrication — Palo Alto, CA
  - Pilot Line & Design Center — Suzhou, China



# Team

## Management



David Fattal  
Founder / CEO



Zhen Peng  
Founder / CTO



Pierre Evreux  
Founder / CFO



Andre Krebbers  
VP Operations



John Rayfield  
VP Engineering



## Advisors



**khosla ventures**



Pierre Lamond



**SONY**

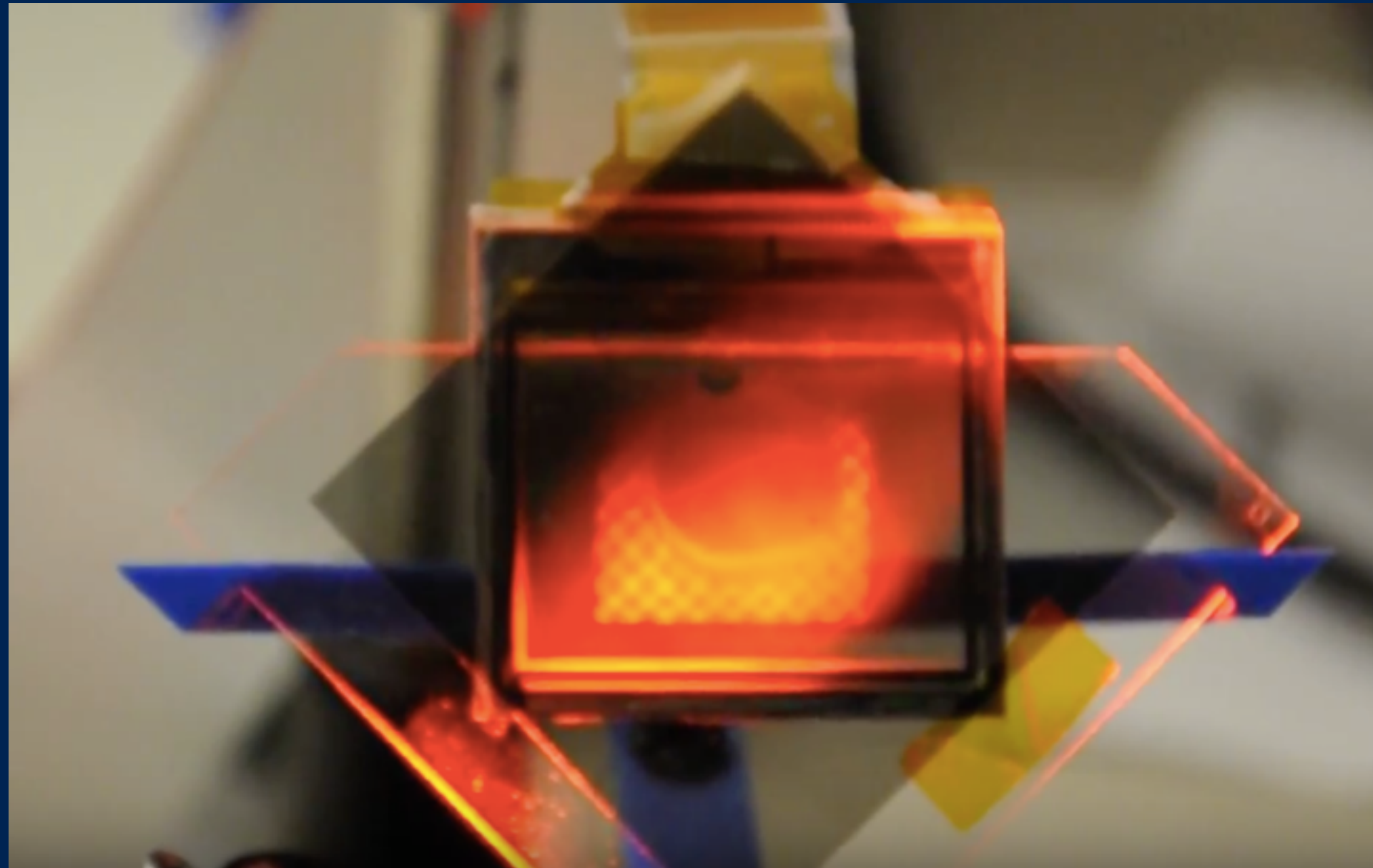
Kunitake Ando

# MIT Technology Review

*“ There has been very little innovation in the basic physics for making 3-D images since early in the 20th century. This new display is transforming a technology that’s been around for 100 years.”*

1 hand  
1 hand  
close eye  
blink left right left right  
  
what do you see?

2013



2015



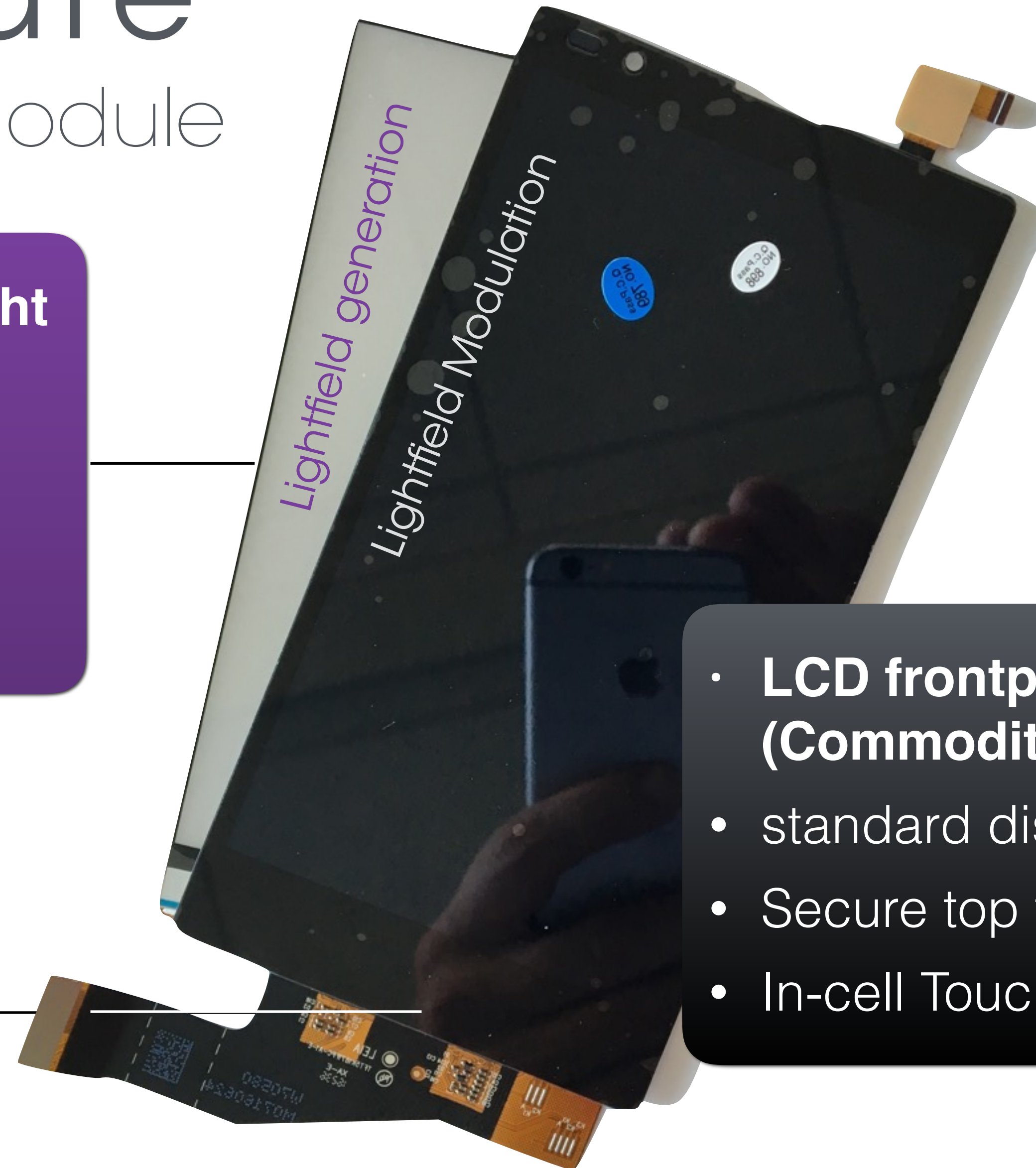
# The Hardware

## Holographic Display Module

- **Diffraction Lightfield Backlight (Proprietary)**
- Core IP (designs and patents)
- compatible with any size
- allows 2D / 3D switch function

- **Display Driver IC (Standard or Custom\*)**
- 3D compression \*
- optimized multiview rendering\*

- **LCD frontplane (Commodity)**
- standard display interface
- Secure top tier supplier
- In-cell Touch / Hover Touch



# The Software

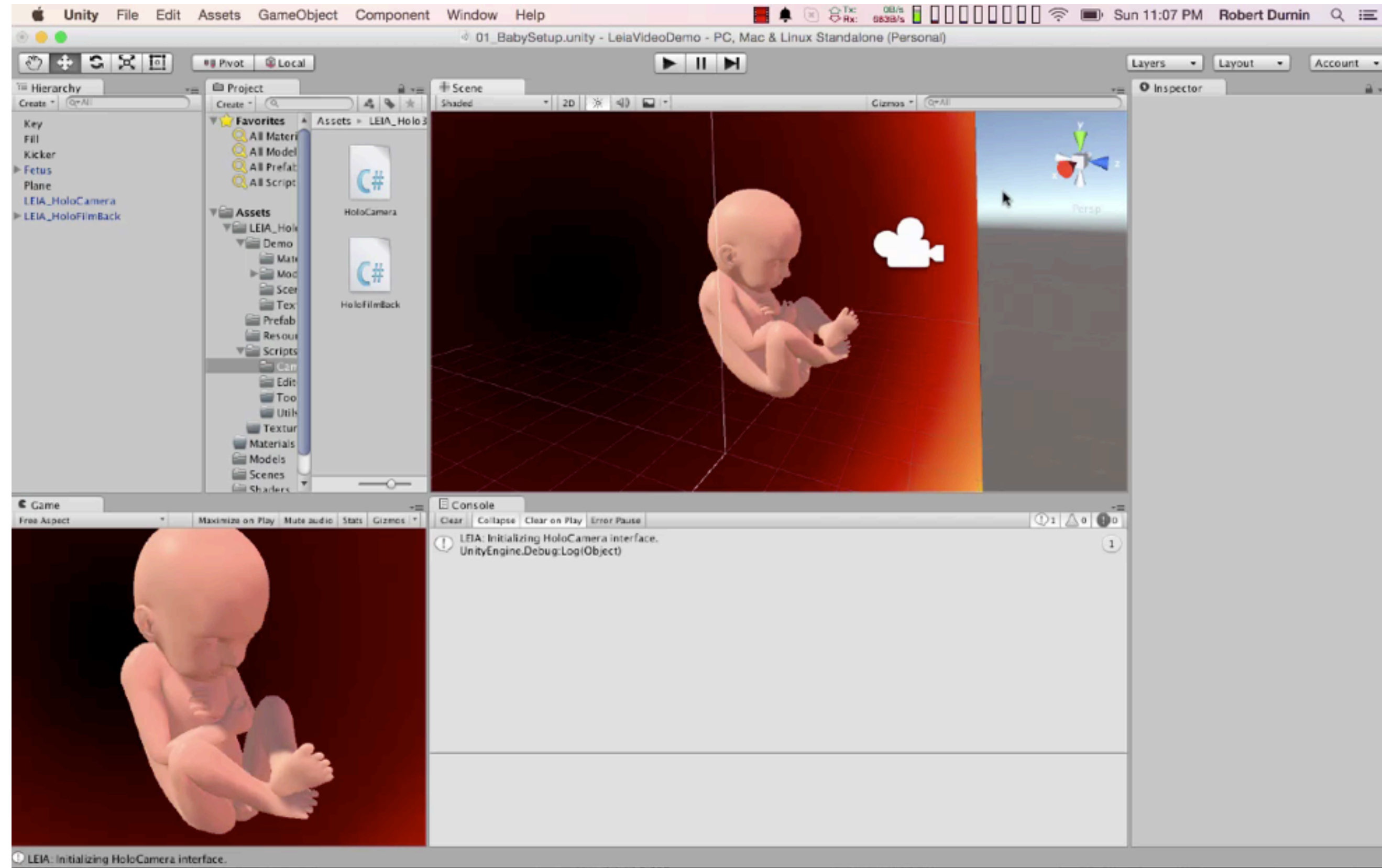
LEIA SDK for Multiview 3D / VR

- Leverages **traditional 3D / VR** dev tools for LEIA platform
- Readily adapts **existing 3D / VR content** (incl. all mobile games!)
- Allows in-app switching between different **rendering modes**
  - 2D — mono VR — stereo VR — Multiview VR — stereo 3D — Multiview 3D





# LEIA SDK



three.js<sup>r69</sup>



[www.leiainc.com/developers](http://www.leiainc.com/developers)

# HoloChat: 3D Avatars on Mobile Light-Field Displays

HoloChat, the first mobile holographic communication system with performance-driven digital avatars, is a key application for holographic face-to-face communication on future mobile devices that may be equipped with light-field displays and 3D sensors.

**Jing Liu**

University of California, Santa Cruz

**Armand Niederberger**

LEIA Inc.

**Jihun Yu**

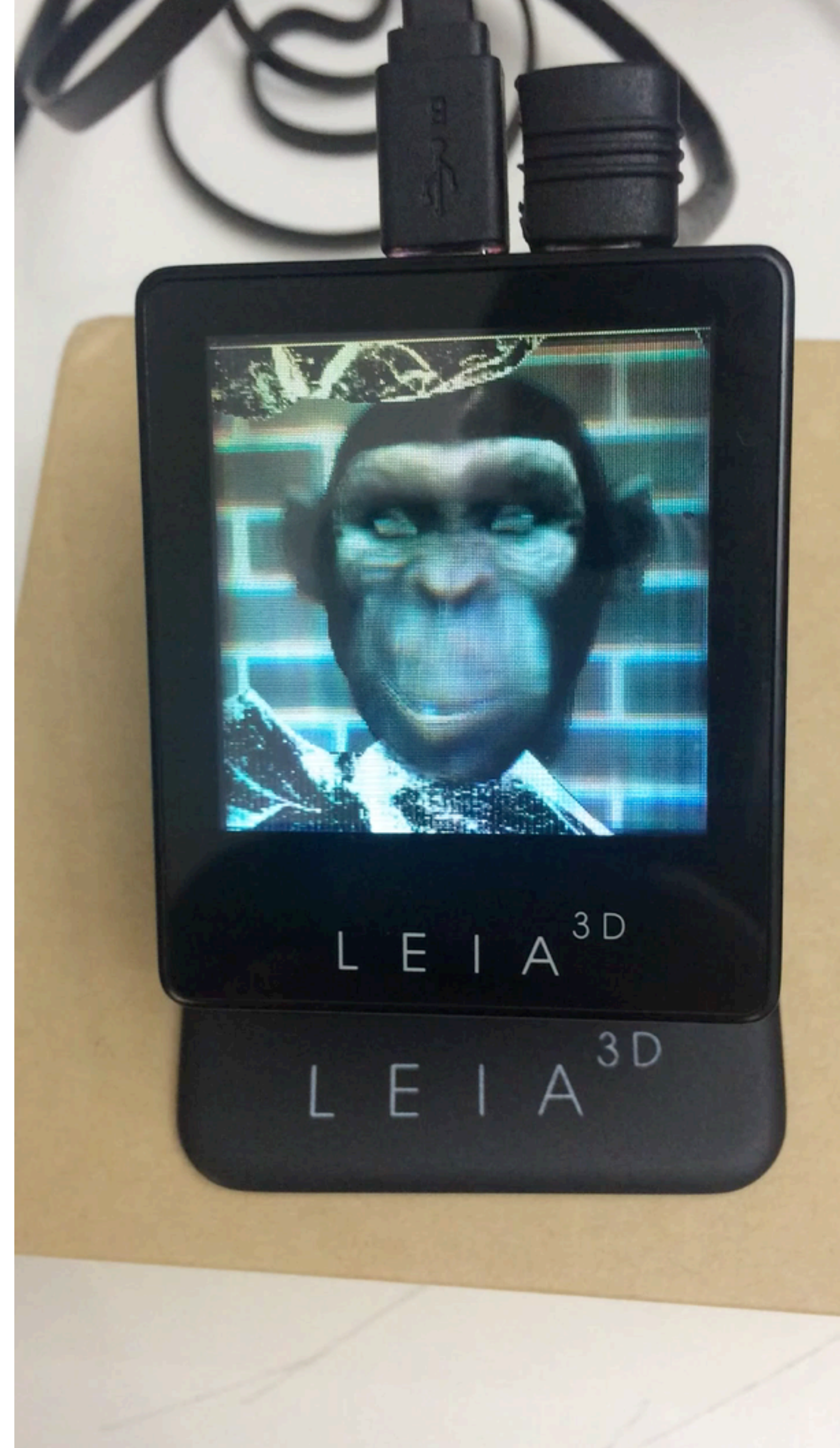
Industrial Light & Magic

**Hao Li**

University of Southern California

**David Fattal**

LEIA Inc.



“The beauty of diffraction...”

–Leia Inc.

Technology  
Multiview Backlight

Autostereoscopic 3D  
without the bad spots !

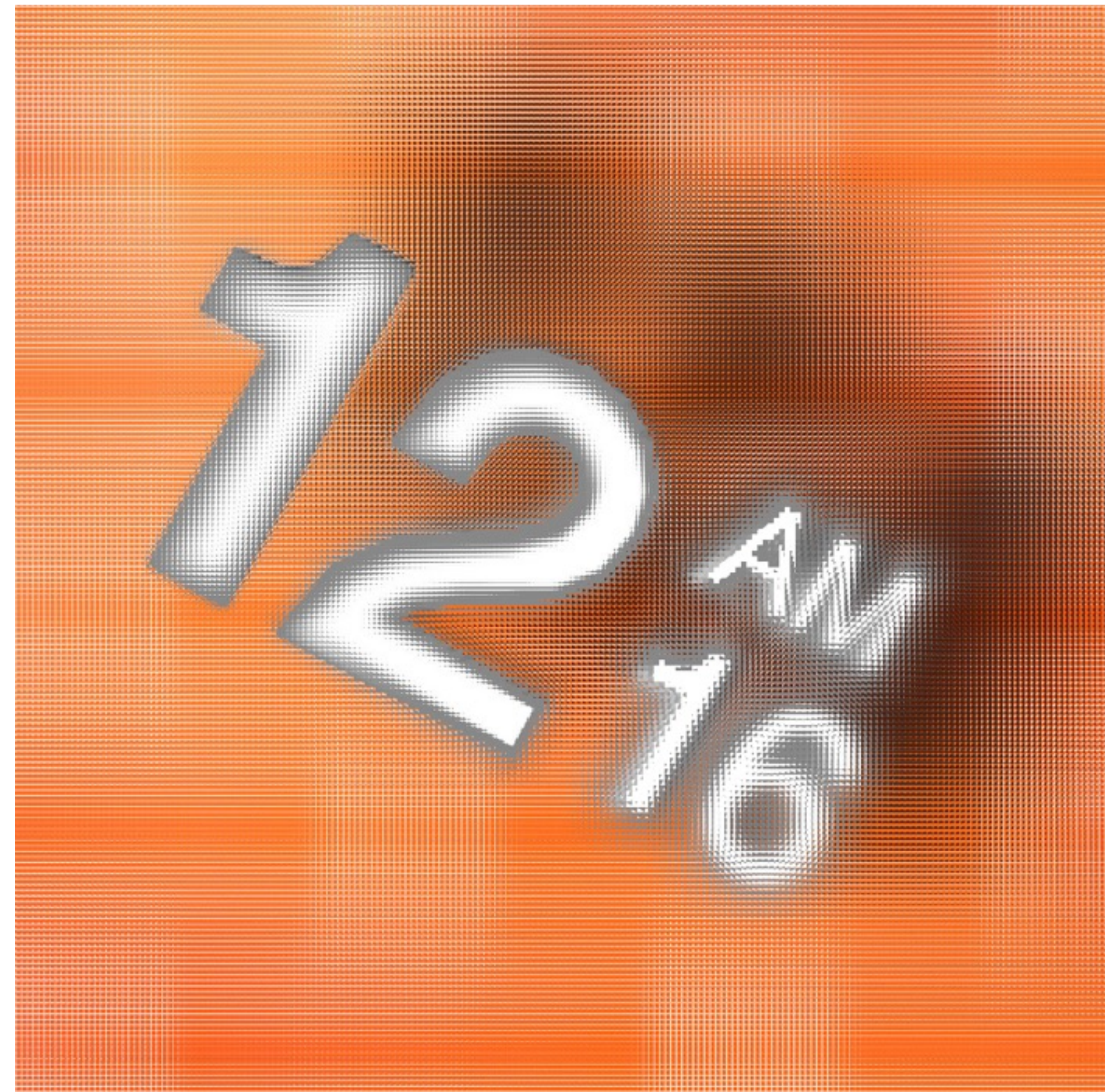
how we see the world demo: audience participation  
1. eye blinking left and right with two fingers in front  
2. move head to show demo of motion parallax

# Multiview 3D

NO glasses, NO eye-tracking



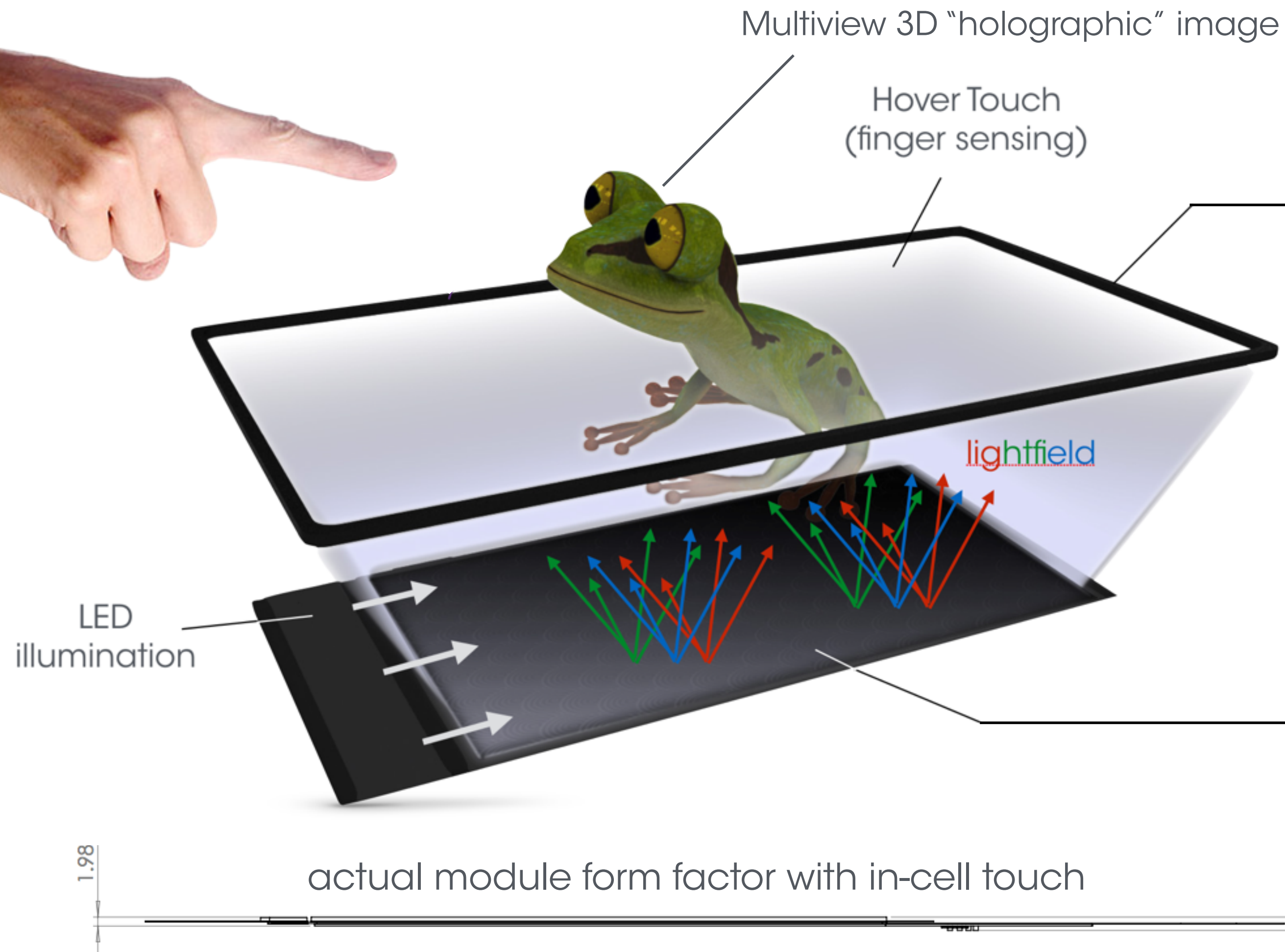
2D display



3D display

# The Hardware (Core Tech)

## Holographic Display Module



### Standard LCD panel

- Commodity technology
- Purchased from third-party supplier
- Capacitive Hover-touch (finger sensing)
- Standard Display Interface (MIPI DSI)

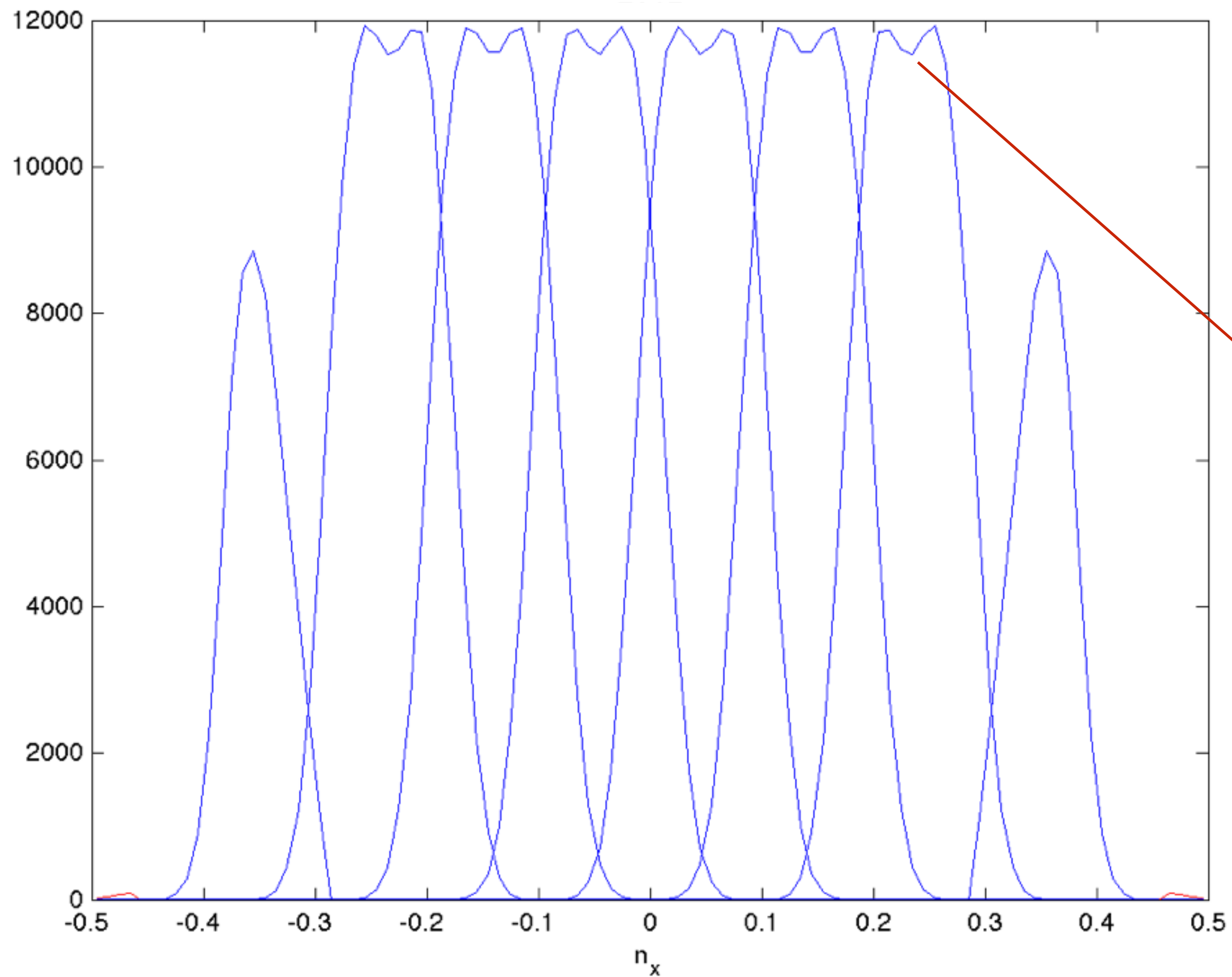
Fabless manufacturing leveraging existing LCD supply chain...

### LEIA proprietary "Multiview" backlight

- Revolutionary new tech (cover Nature 2013)
- Source of differentiation (Nanotechnology)
- Standard LED and optics = low-cost
- Dual backlight for 2D / 3D switch function

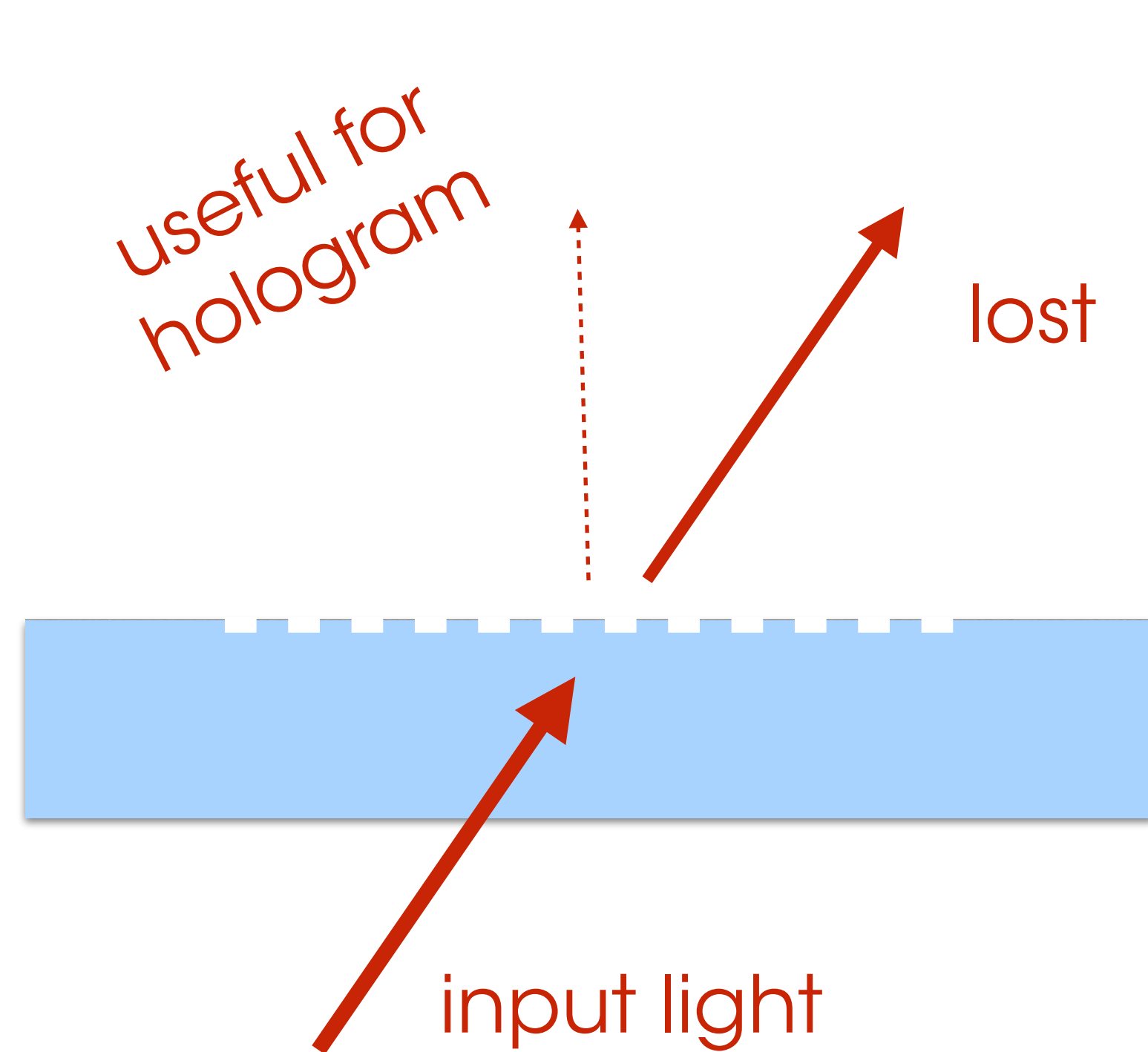
# No bad spots !

Brightness vs View Angle

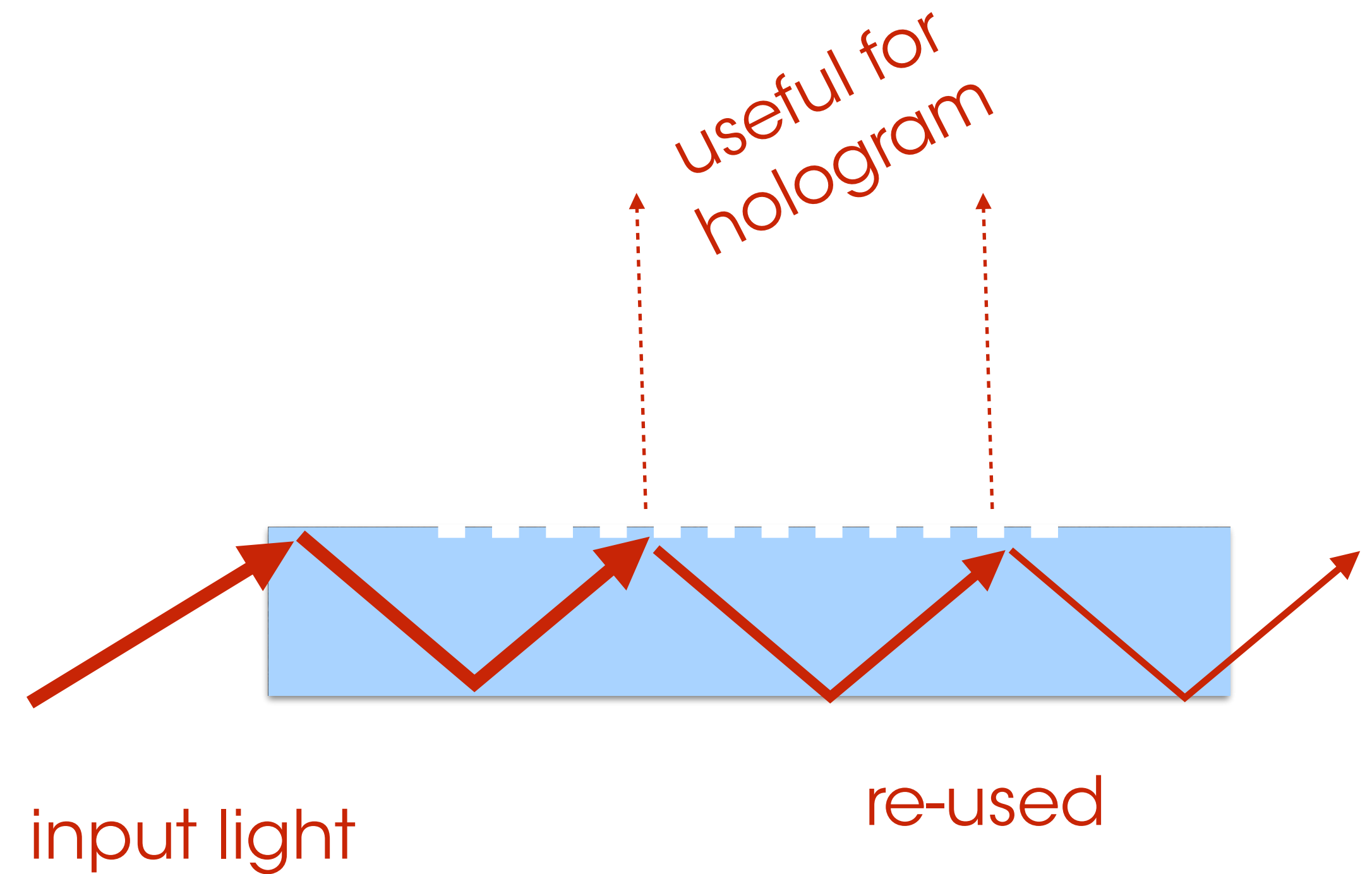


controlled radiation pattern

# Diffraction = lost light ?

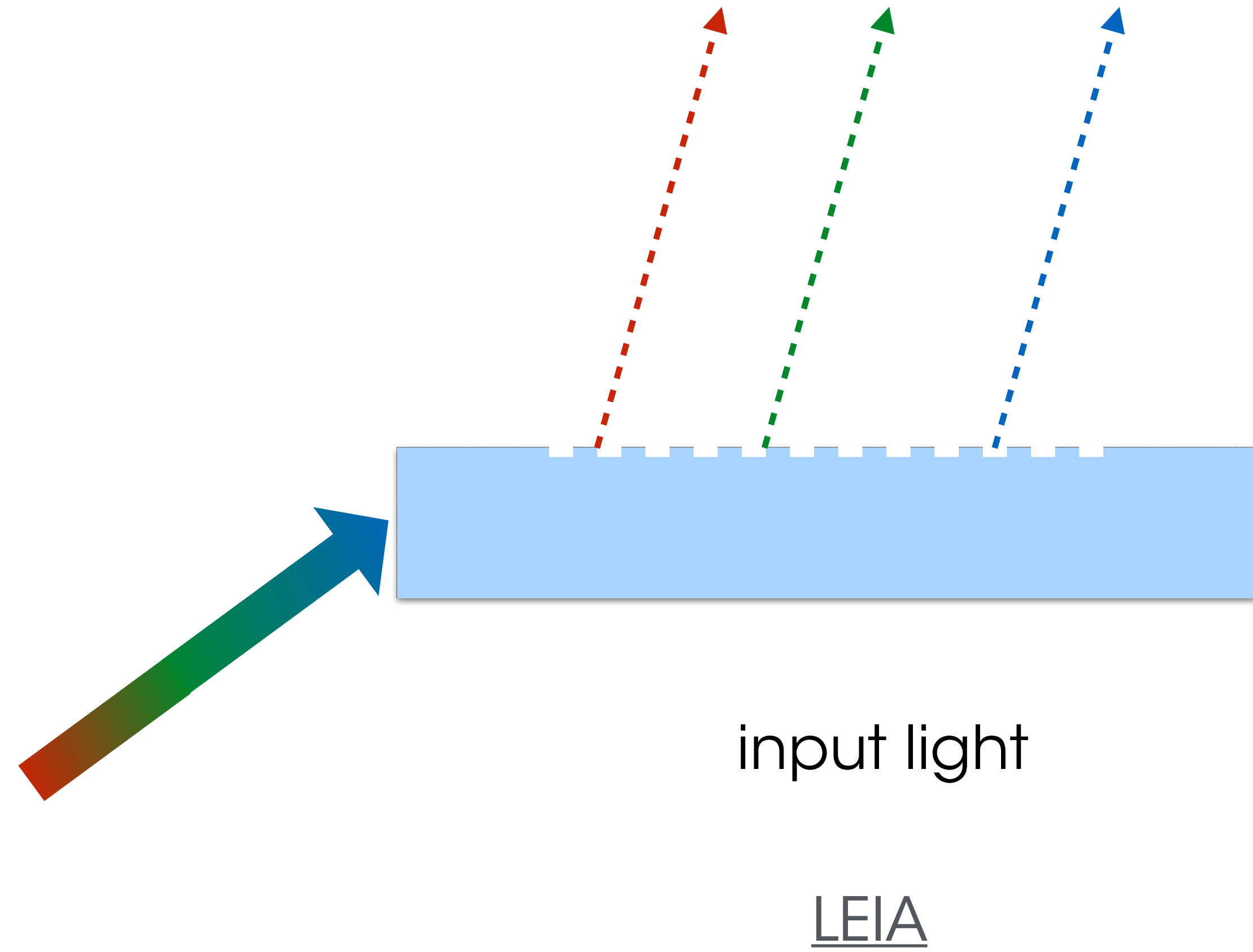
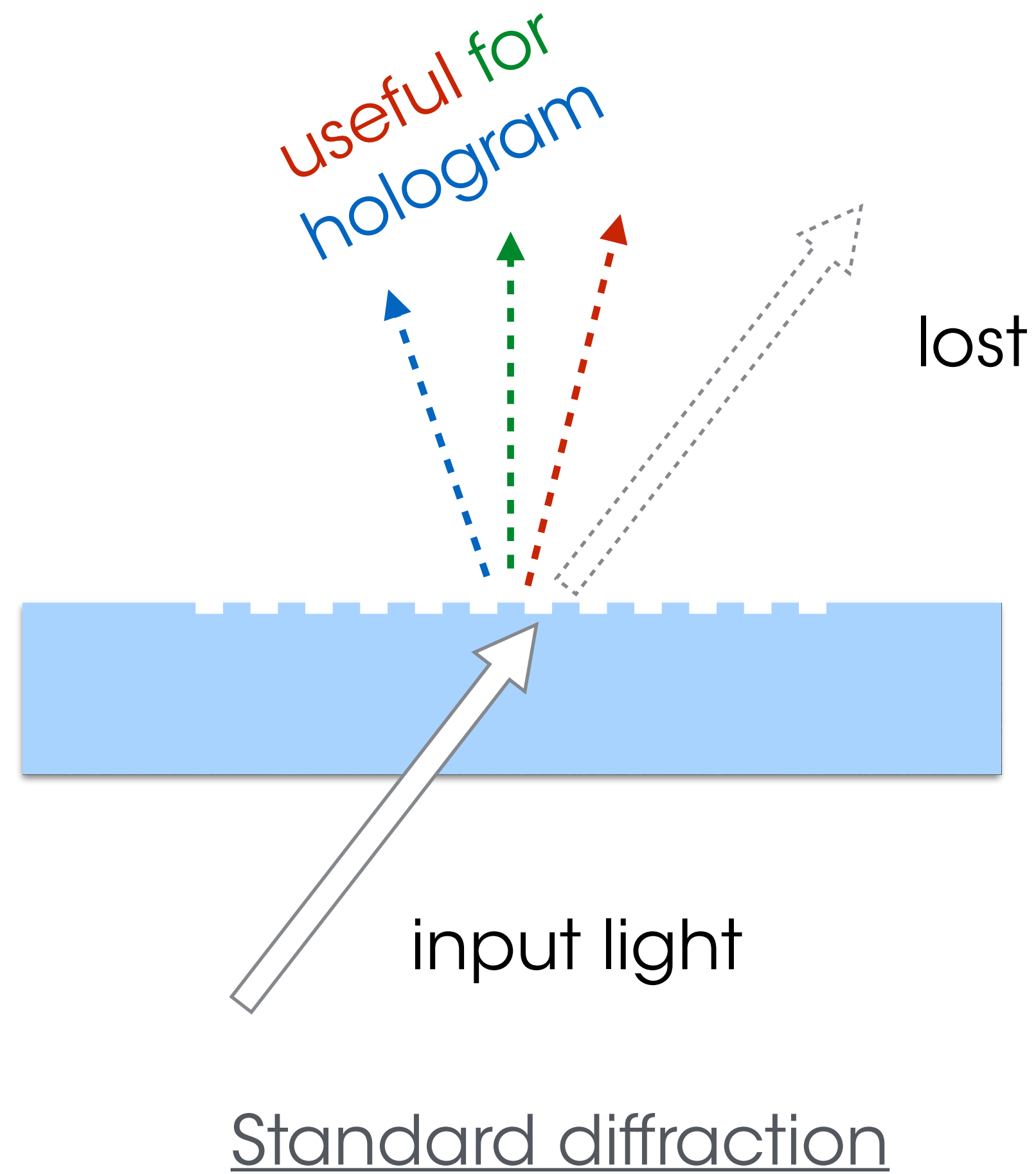


Standard diffraction



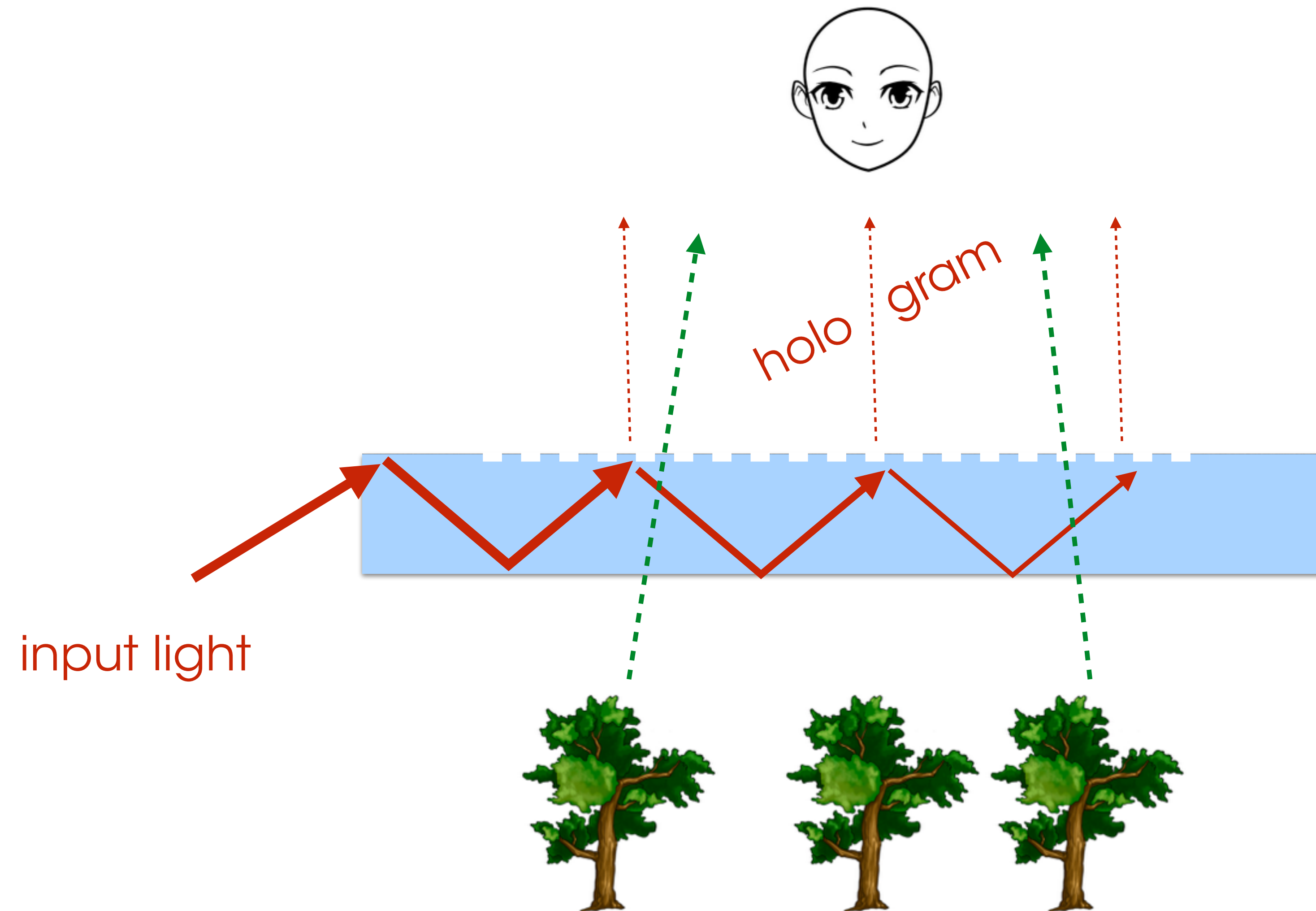
LEIA

# Diffraction = Color breakup ?

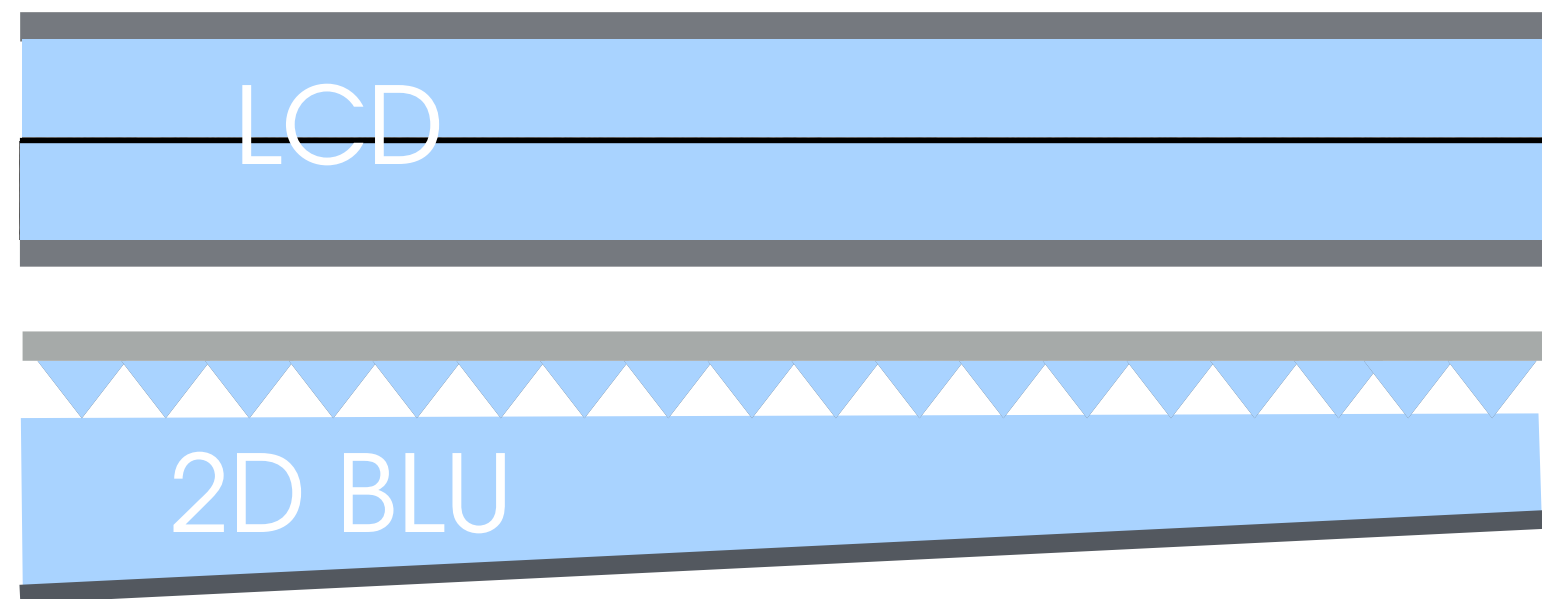




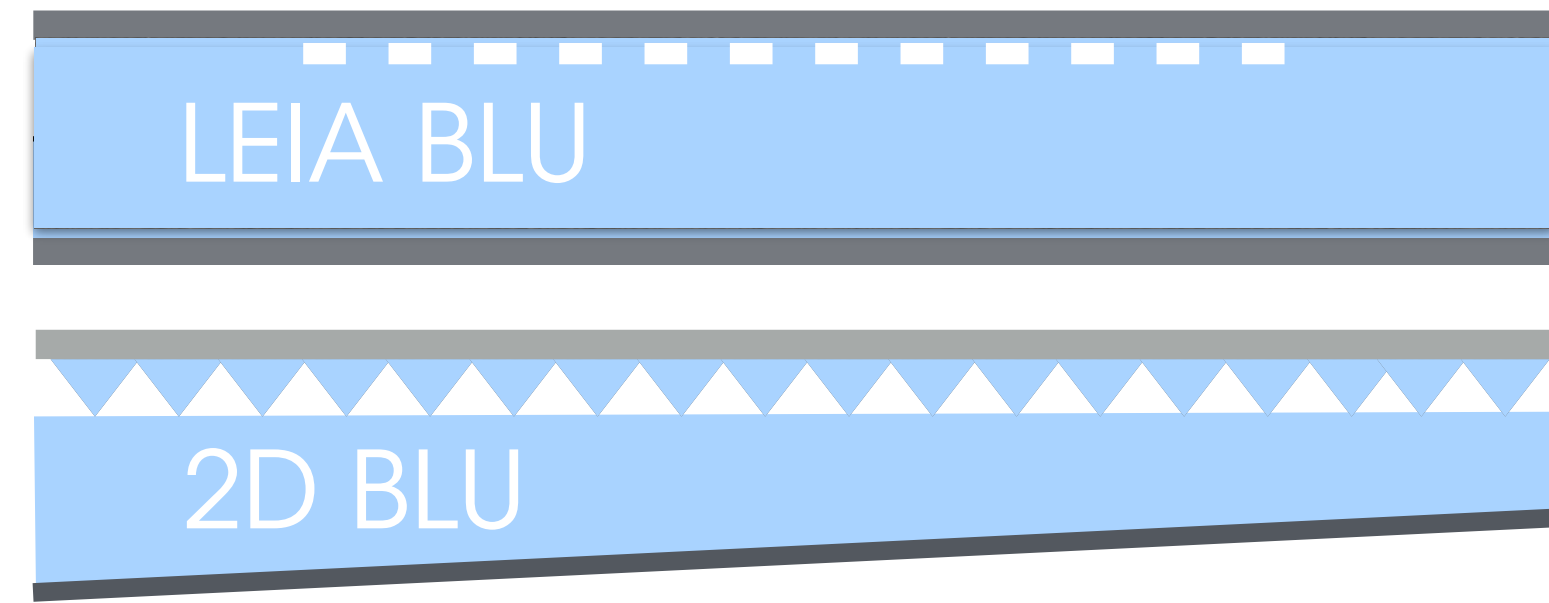
# Transparency



# 2D / 3D (basic)



2D display



2D /3D display



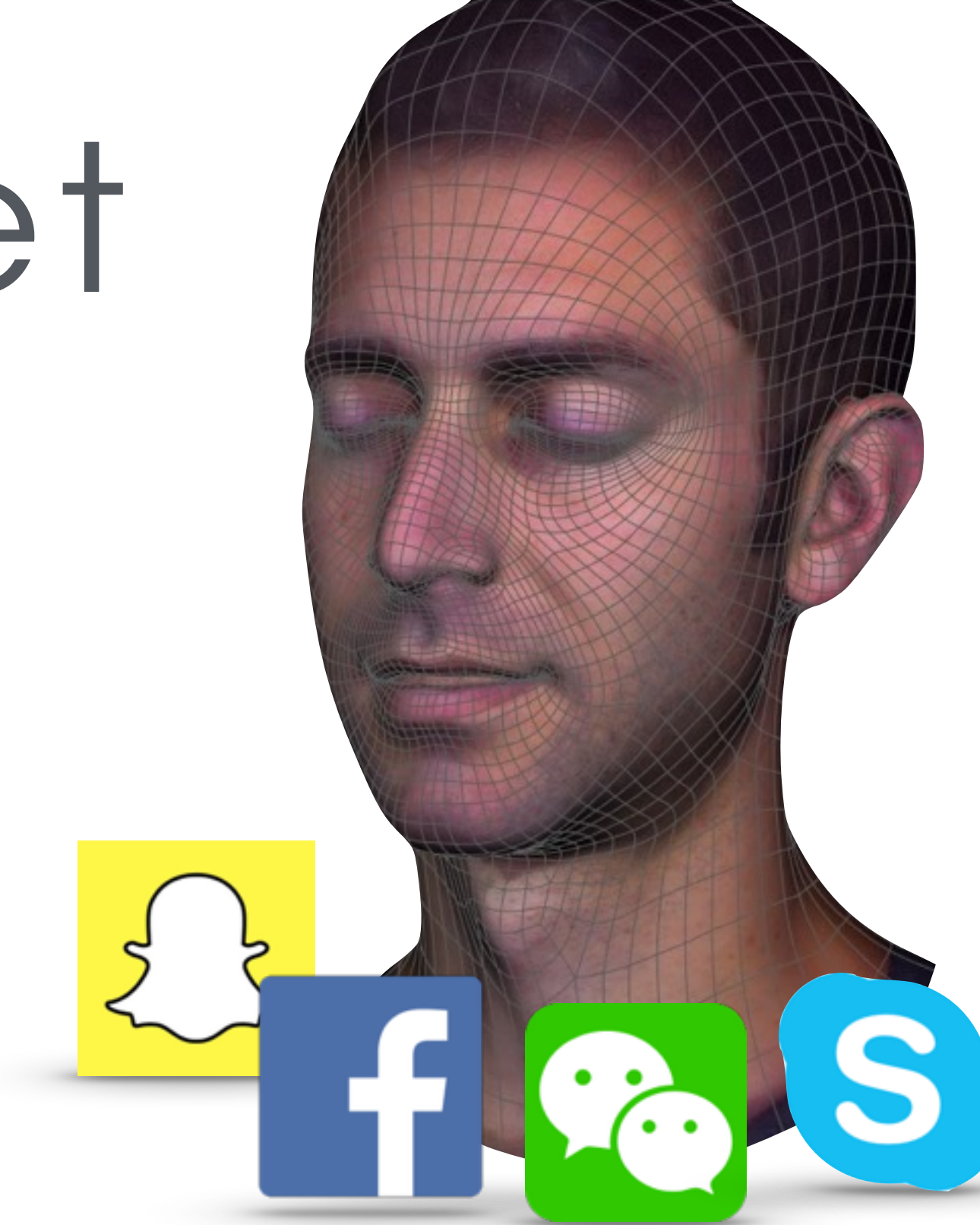
# Mobile market

- **Use Cases**

- Games
- 3D Selfies / Avatars / Holochat
- E-commerce
- VOD / VR on mobile

- **Operators / OEMs traction**

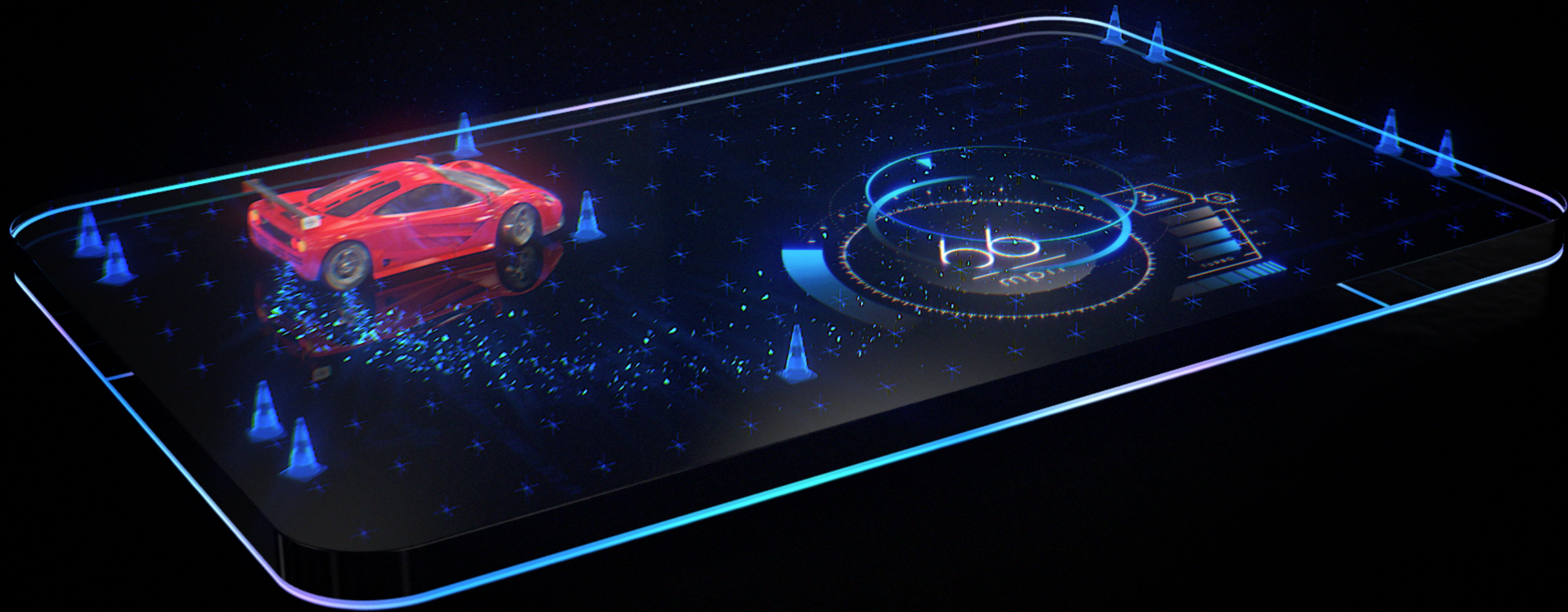
- First deal with Altice and partner OEM for release in Q4 2017
- Setting up partnerships with major operators worldwide



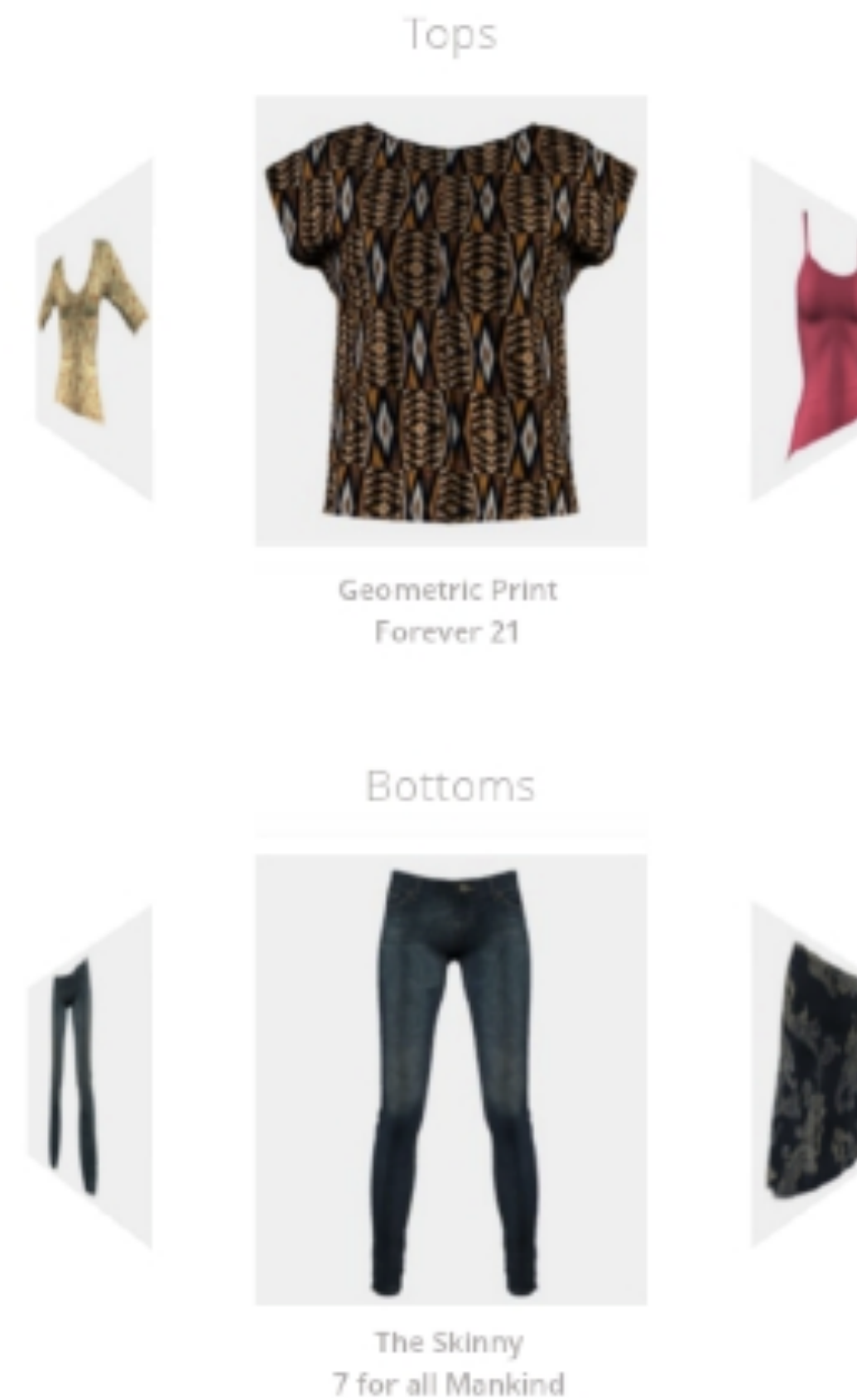
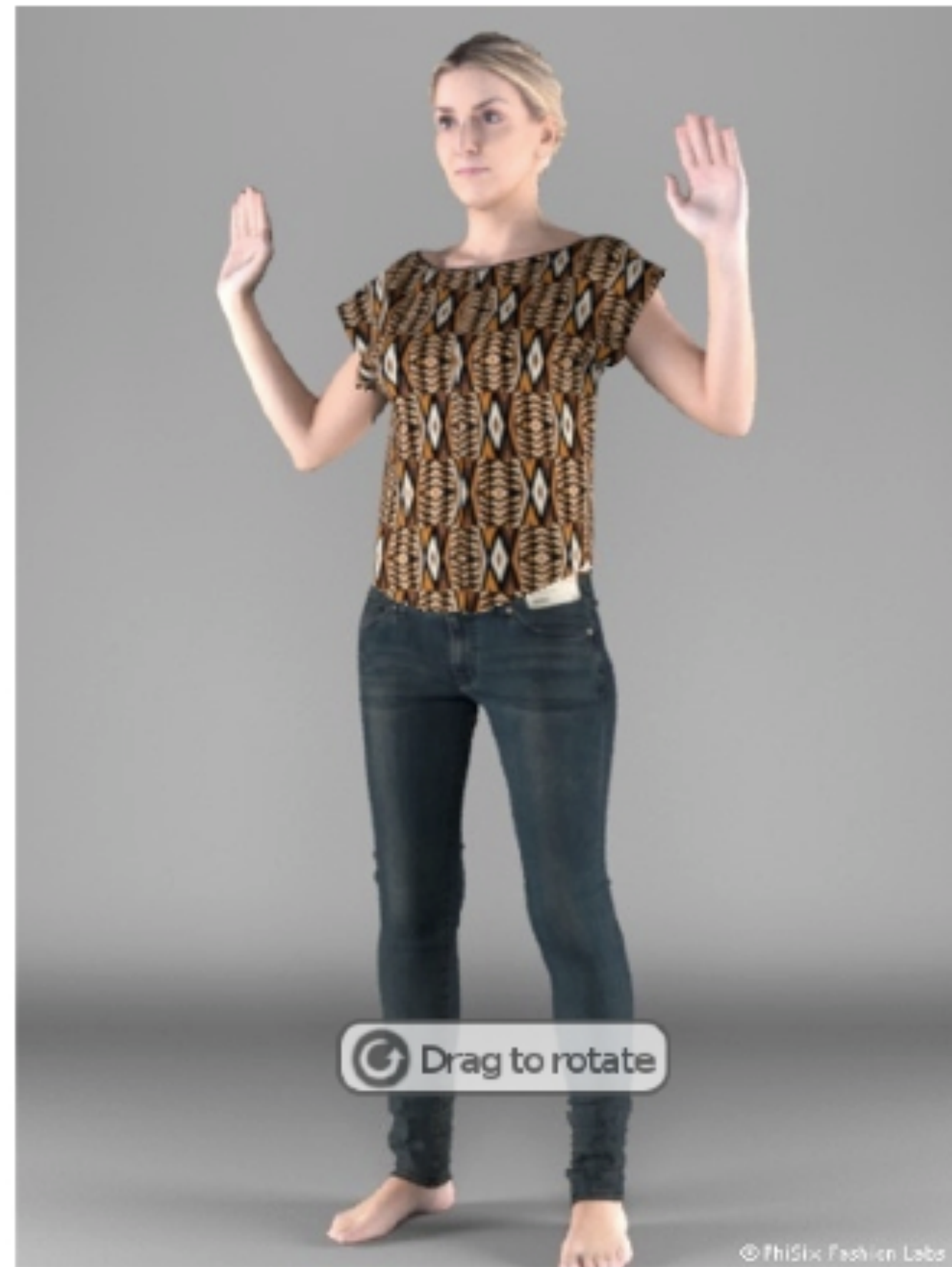
- **Content Provider deals**

- Partnerships with game publishers to adapt existing hit games
- Revenue sharing with gaming studios / mobile app provider

# Gaming



# E-commerce



Virtual Fitting Room

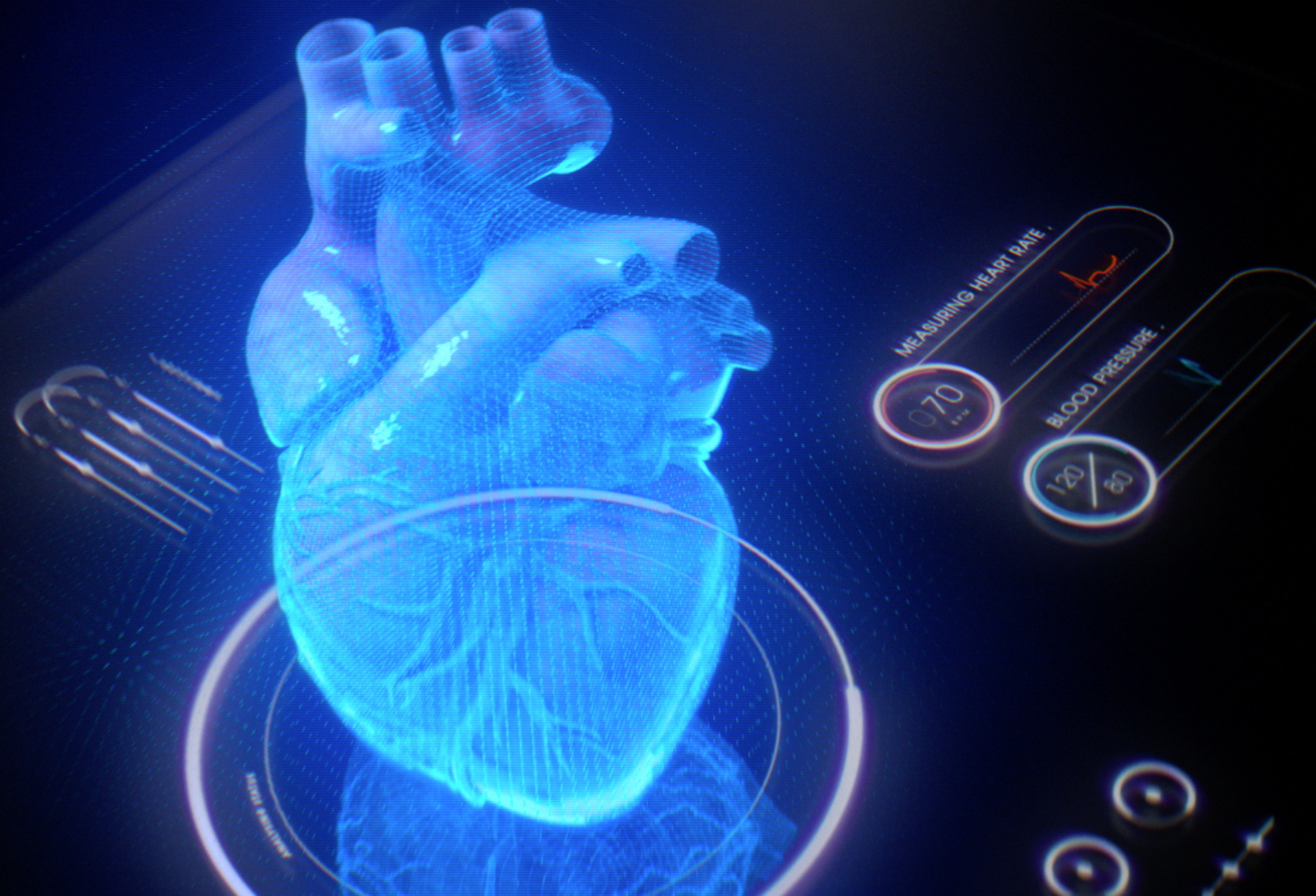
<http://techcrunch.com/2014/02/19/>

# Education



Learning in Future Education 1, or LiFE 1  
European International Research Agency, 2010-11  
Seven European countries, 740 students, 47 teachers and 15 schools

# Healthcare





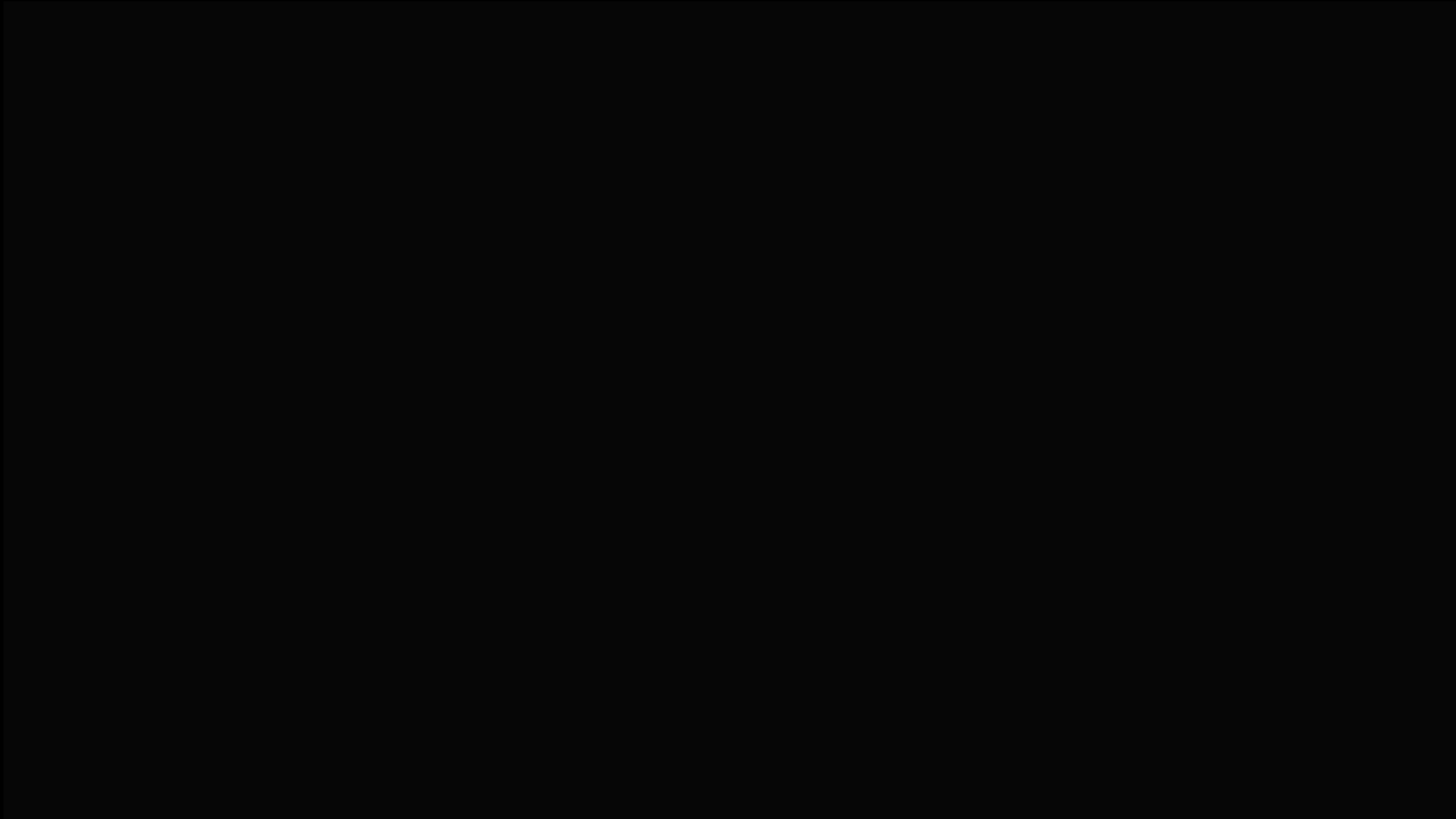
# Smartphone / tablet



# Automotive HMI



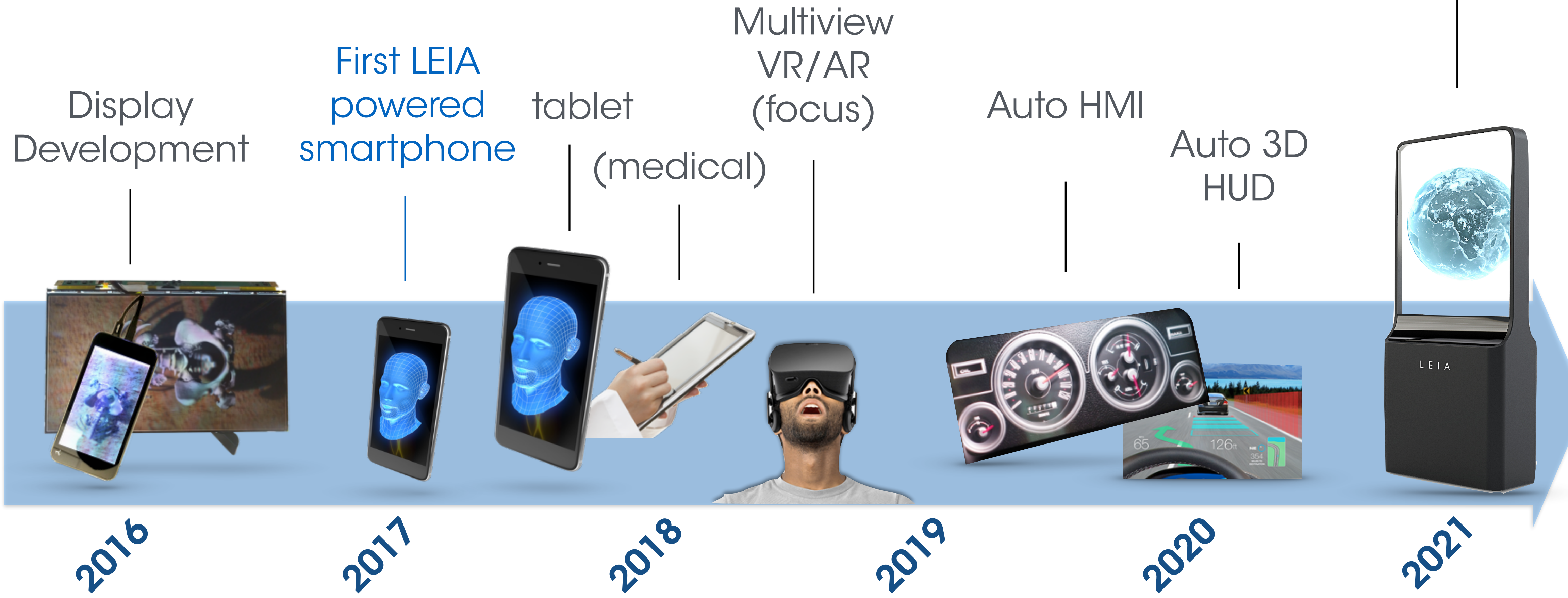
# Automotive HMI



# Continuous innovation

Market / Product roadmap

See-through display  
(interactive glass panels)







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