LIGHT FIELD LAB
™

JON KARAFIN

CEO | LIGHT FIELD LAB, INC.

JON@LIGHTFIELDLAB.COM

www.lightfieldlab.com

@lightfieldlab

facebook.com/lightfieldlab/

HOLOGRAPHIC CONTENT CONSIDERATIONS

METHODS FOR EFFICIENT DATA TRANSMISSION AND CONTENT CREATION METHODOLOGIES

/ Light Field Display

CONSIDERATIONS FOR COMPELLING HOLOGRAPHIC DISPLAY

RAYS PER DEGREE

Ray density results in greater rendering of reality.

VIEW VOLUME

This controls the amount of freedom the viewer has to move in a given light field space.

2D EQUIVALENT RESOLUTION

This determines the number of active rays that can be delivered for any 2D slice in space.

3

ASSETS FOR INTERACTIVE LIGHT FIELD EXPERIENCES

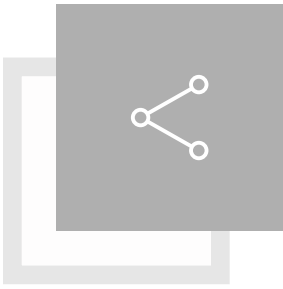## / Minimal Dataset For Light Field Volume

RGB DATA FOR ARRAY SAMPLES

These viewpoints help define sample density, viewing volume and overall volumetric quality.

SURFACE COORDINATES PER SAMPLE

Accuracy is essential for these coordinates, otherwise temporal and spatial artifacts will result.

VIRTUAL CAMERA COORDINATES AND METADATA

Maintaining a singular world coordinate system is key to aligning the light field projection to the interactive camera coordinates.

RAW LIGHT FIELD SAMPLES

Raw Holographic Bandwidth Requirements

STREAMING RAW LIGHT FIELD DATA IS SIMPLY NOT POSSIBLE UNCOMPRESSED

Requires > 500GB/s - TB+/s (depending on specification)

LFL'S CODEC AND PROCESS

Light Field Codecs – Hybrid Processing

ENCODING/DECODING PROCESS CAN VECTORIZES LF DATA INTO AN OFFLINE/ONLINE HYBRID FORMAT

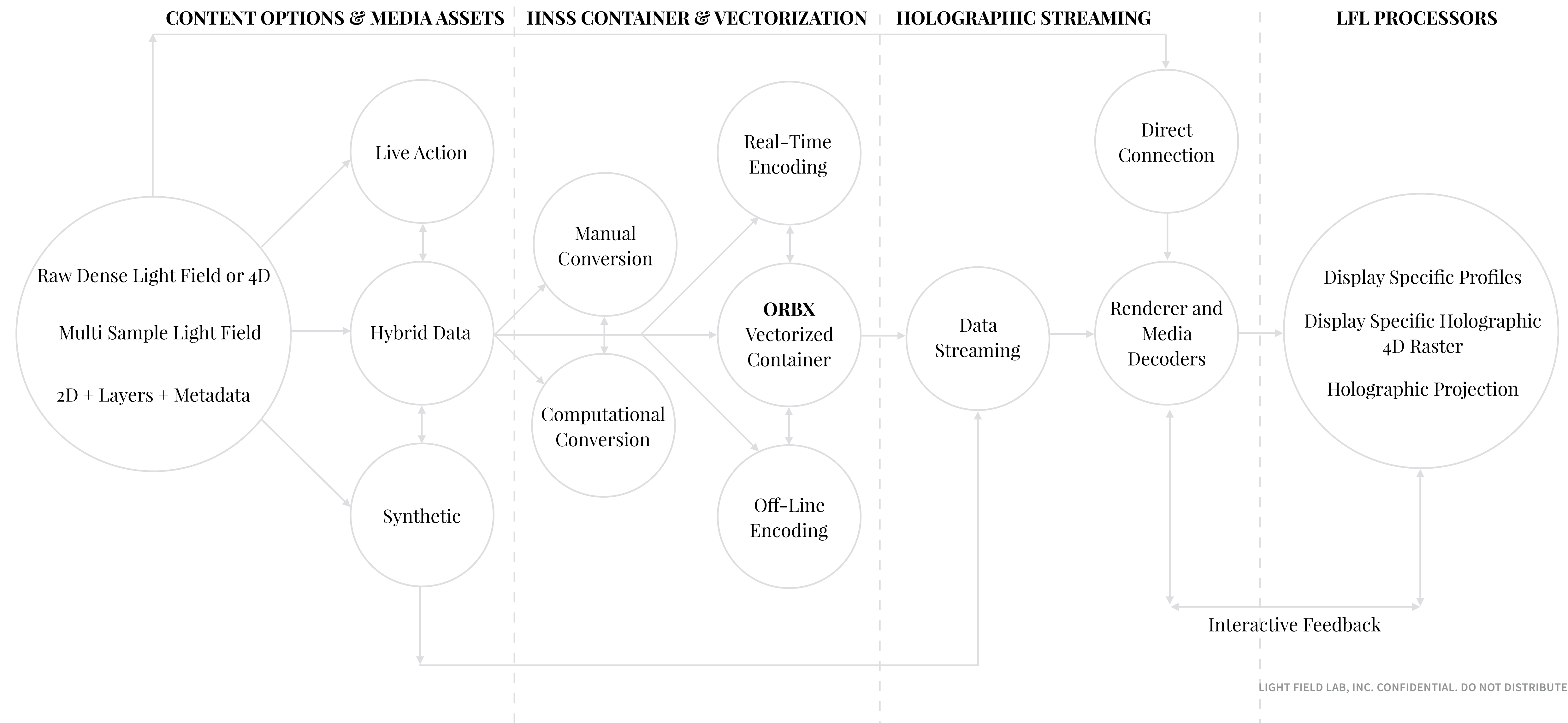~ 300Mbps+ VBR target for the same single display dataset

(5G Compliant)

LFL'S 2D AND LEGACY SUPPORT

Light Field Codecs – Volumetric Representation

FURTHER REDUCTION OF HOLOGRAPHIC DATA INTO A VOLUMETRIC ONLY FORM CAN BE STREAMED TODAY

~10 - 30+ Mbps VBR target for the same dataset reduced to Volumetric information only

HOLOGRAPHIC CONTENT WORKFLOW OPTIONS

Raw Dense Light Field or 4D

Multi Sample Light Field

2D + Layers + Metadata

Live Action

Hybrid Data

Synthetic

Manual Conversion

Computational Conversion

Real-Time Encoding

ORBX Vectorized Container

Off-Line Encoding

Data Streaming

Direct Connection

Renderer and Media Decoders

Display Specific Profiles

Display Specific Holographic 4D Raster

Holographic Projection

Interactive Feedback

BREAKING DOWN LIGHT FIELD MYTHS

HELPING CLARIFY SOME MISUNDERSTOOD CONCEPTS

TUPAC IS <u>NOT</u> A HOLOGRAM

NOR WAS HE IN STAR WARS

Tupac was actually a simple 2D projection on a piece of transparent film. It's an old carnival sideshow trick used for over a century, and can even be seen at the Haunted Mansion in Disney World.

–

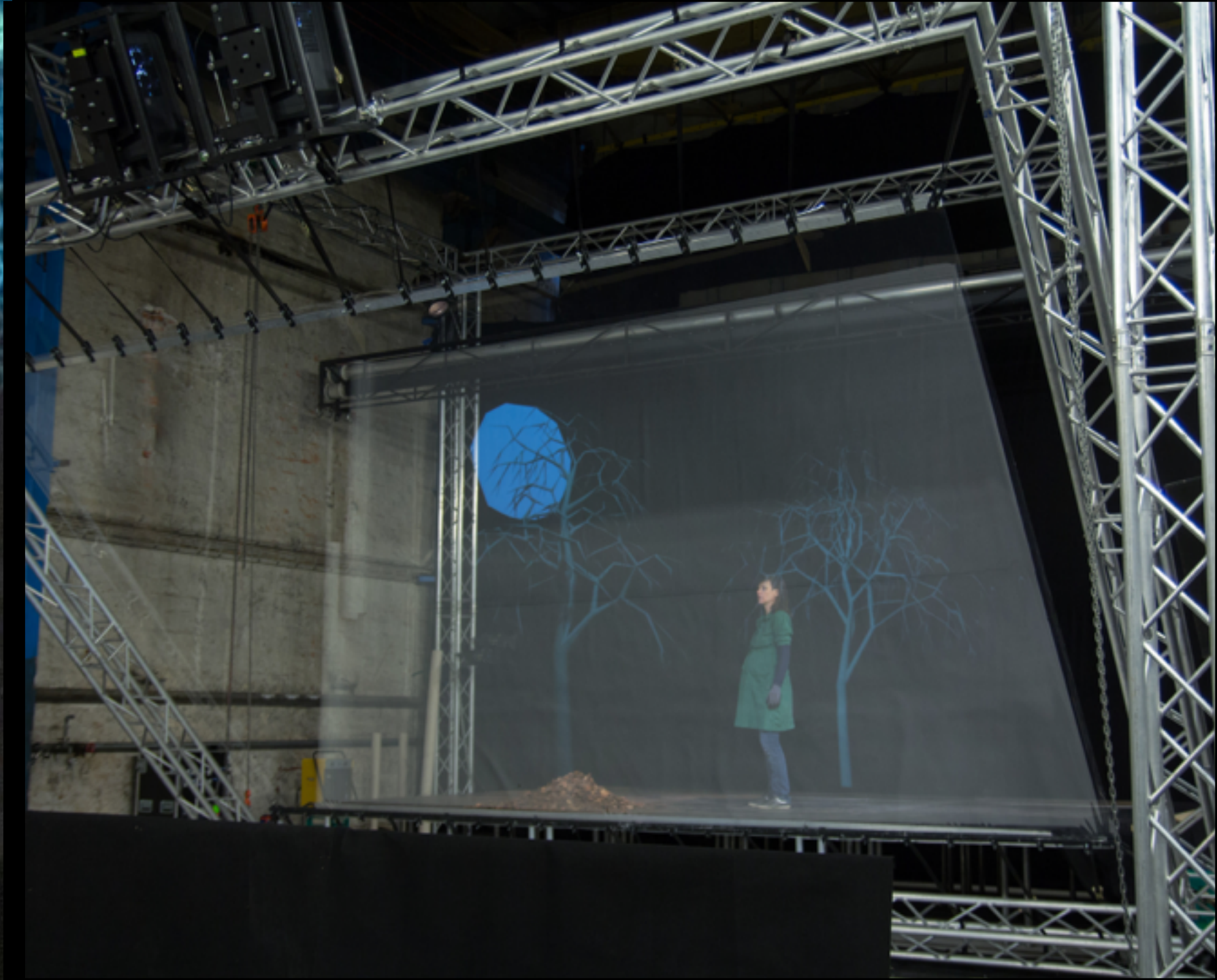*Tupac was a projection technique called "Pepper's Ghost"*

PEPPER'S GHOST

H+Technology

HOLOGRAM USA

ProVision

VNTANA

Musion

AIM

REALFICTION™

VR AND AR
ARE <u>NOT</u> HOLOGRAPHIC

AR AND VR TECHNOLOGIES DO NOT PROJECT RAYS INTO SPACE. RATHER, THEY ARE STEREOSCOPIC DISPLAYS.

While both AR and VR may sample from a light field dataset, the technology does not present a light field to the viewer.

–

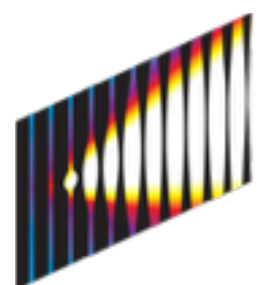*VR and AR are both considered :*

"Motion Induced" Light Field

STEREOSCOPIC HMD

REAL VIEW

oculus

VIVE

AVEGANT GLYPH

YOU <u>CANNOT</u> FREEZE LIGHT IN MID-AIR

SCIENCE FICTION AND MOVIE MAGIC CAN DO THE IMPOSSIBLE— UNFORTUNATELY, PHYSICS CANNOT

In order to form a hologram, you need to be able to see a light emitting source. This is known as the "eye-line" rule

All volumetric technologies require a reflective or emissive medium, conceptually like Pepper's Ghost, but with variable locations to form light
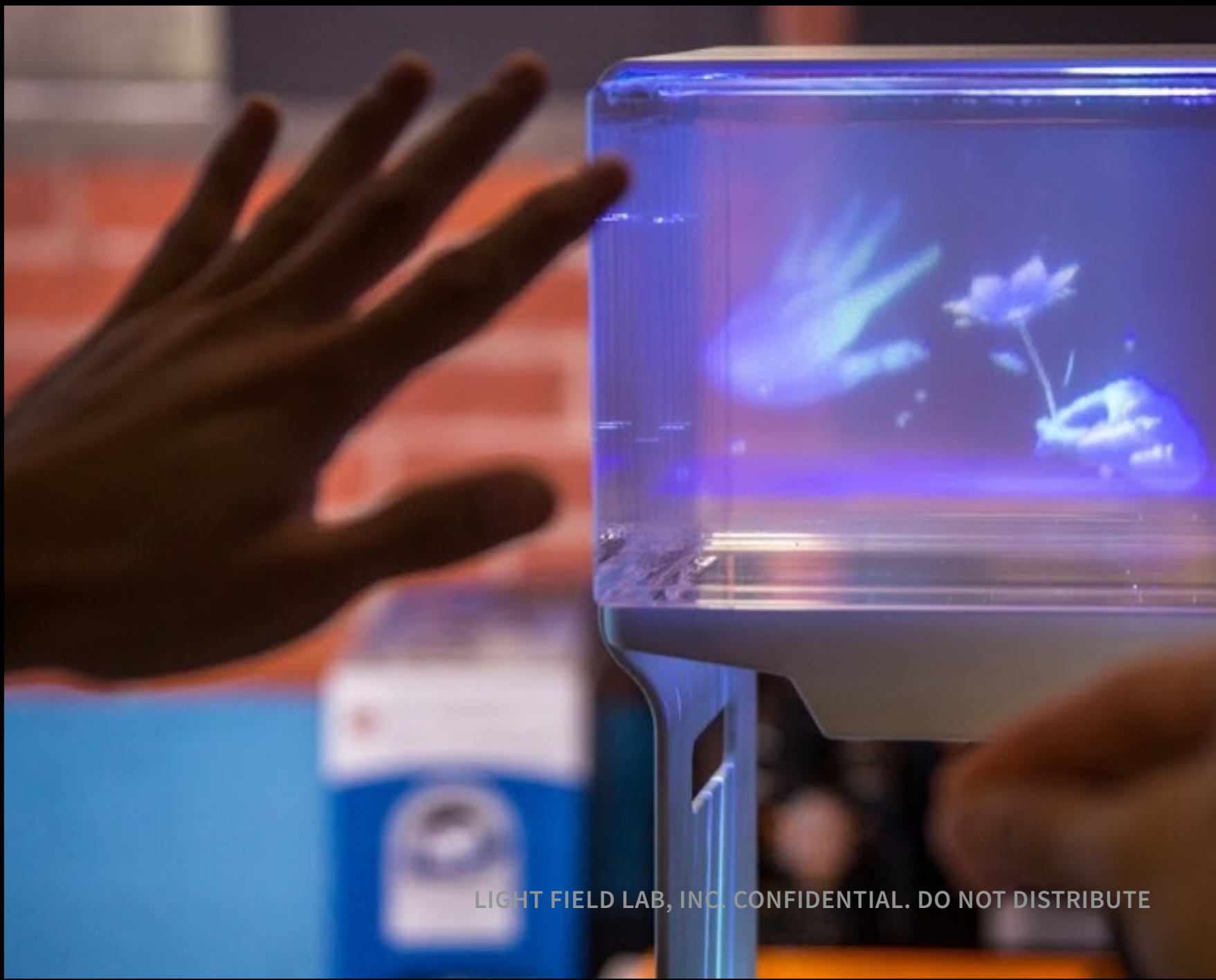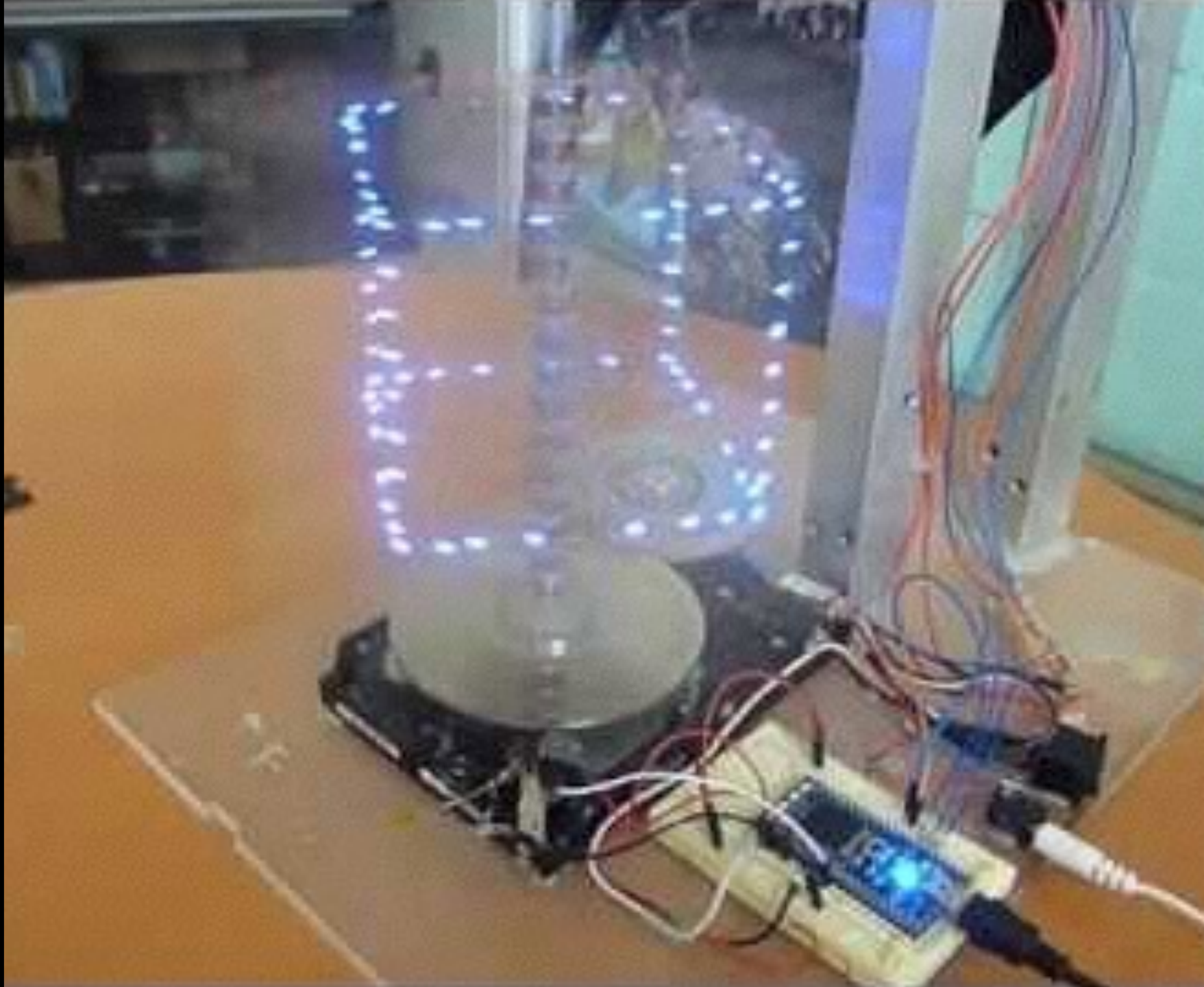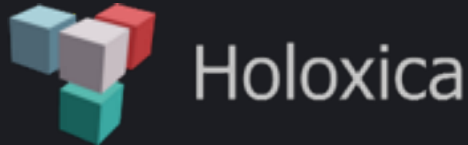
–

Many marketing images of a hologram take artistic liberties (we do as well!)

"Breaking the frame" shows objects where no illumination source exists— albeit not possible

VOLUMETRIC DISPLAY

Aerial Burton

Holoxica

LOOKING GLASS

VOXON
PHOTONICS

LEIA

LightSpace
Technologies

AUTO
STEREOSCOPIC
&
HORIZONTAL
MULTIVIEW
DISPLAY

DIMENCO

LEIA 3D

JDI

Nintendo

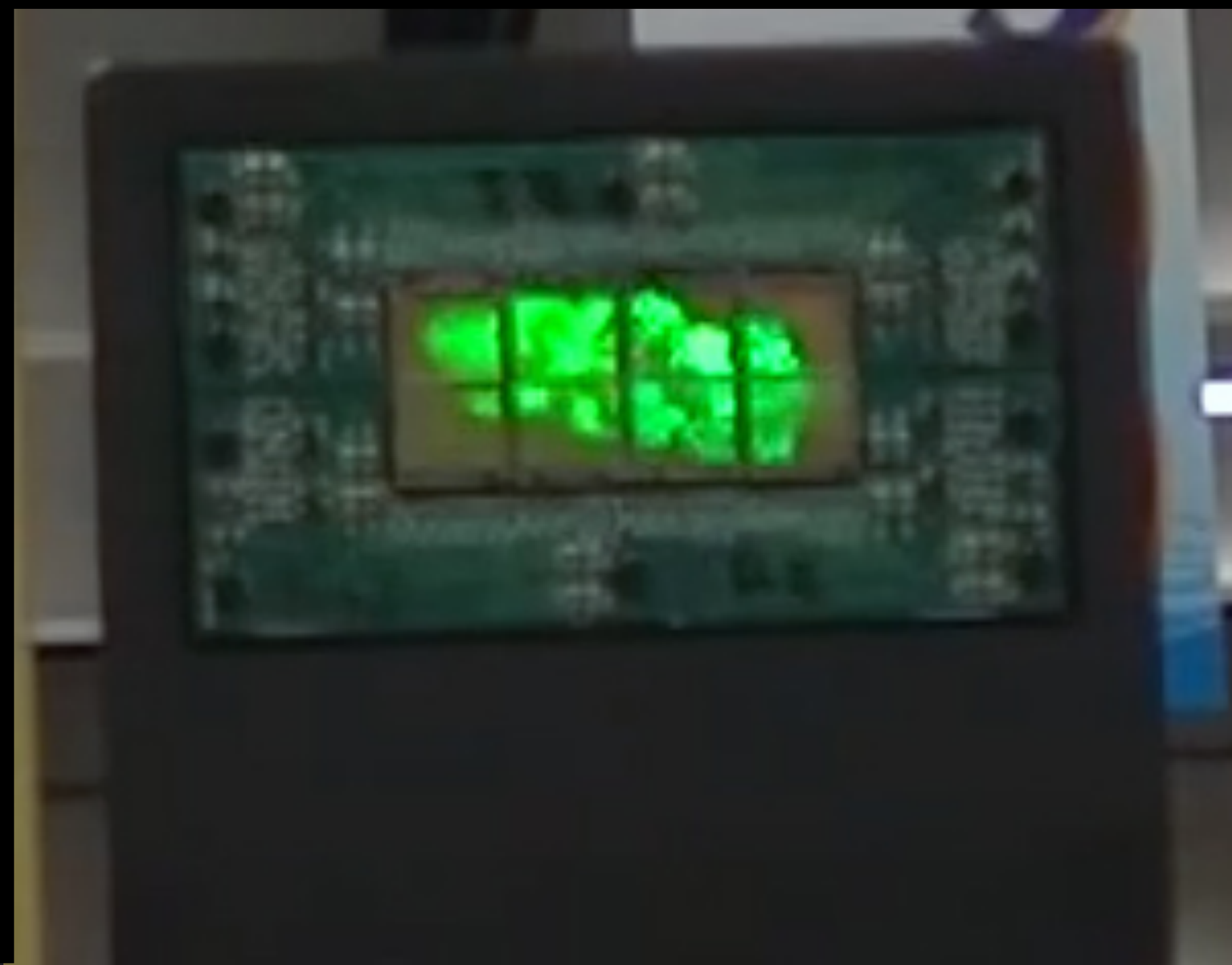ALIOSCOPY

Magnetic3D

FULL PARALLAX DIRECTION MULTIPLEX DISPLAY

HOLOGRAFIKA

SeeReal Technologies

mit media lab

FOVI3D

Ostendo Technologies, Inc.

QUESTIONS?
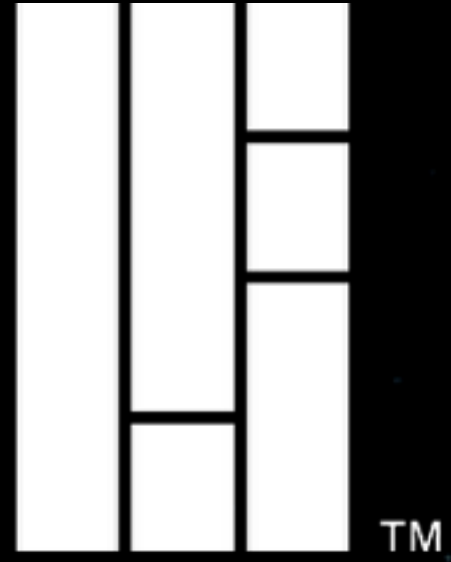
We Are Standing By With Answers

BRENDAN BEVENSEE

CTO

JON KARAFIN

CEO

JON@LIGHTFIELDLAB.COM

ED IBE

VP

LIGHT FIELD LAB

JON KARAFIN

CEO | LIGHT FIELD LAB, INC.

JON@LIGHTFIELDLAB.COM

www.lightfieldlab.com

@lightfieldlab

facebook.com/lightfieldlab/