LOOKING GLASS PORTRAIT REVIEW

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AGENDA

Introduction & History

Technical Specs

Software utilities

Image Capture & Hologram Types

Summary Pros and Cons

INTRODUCTION
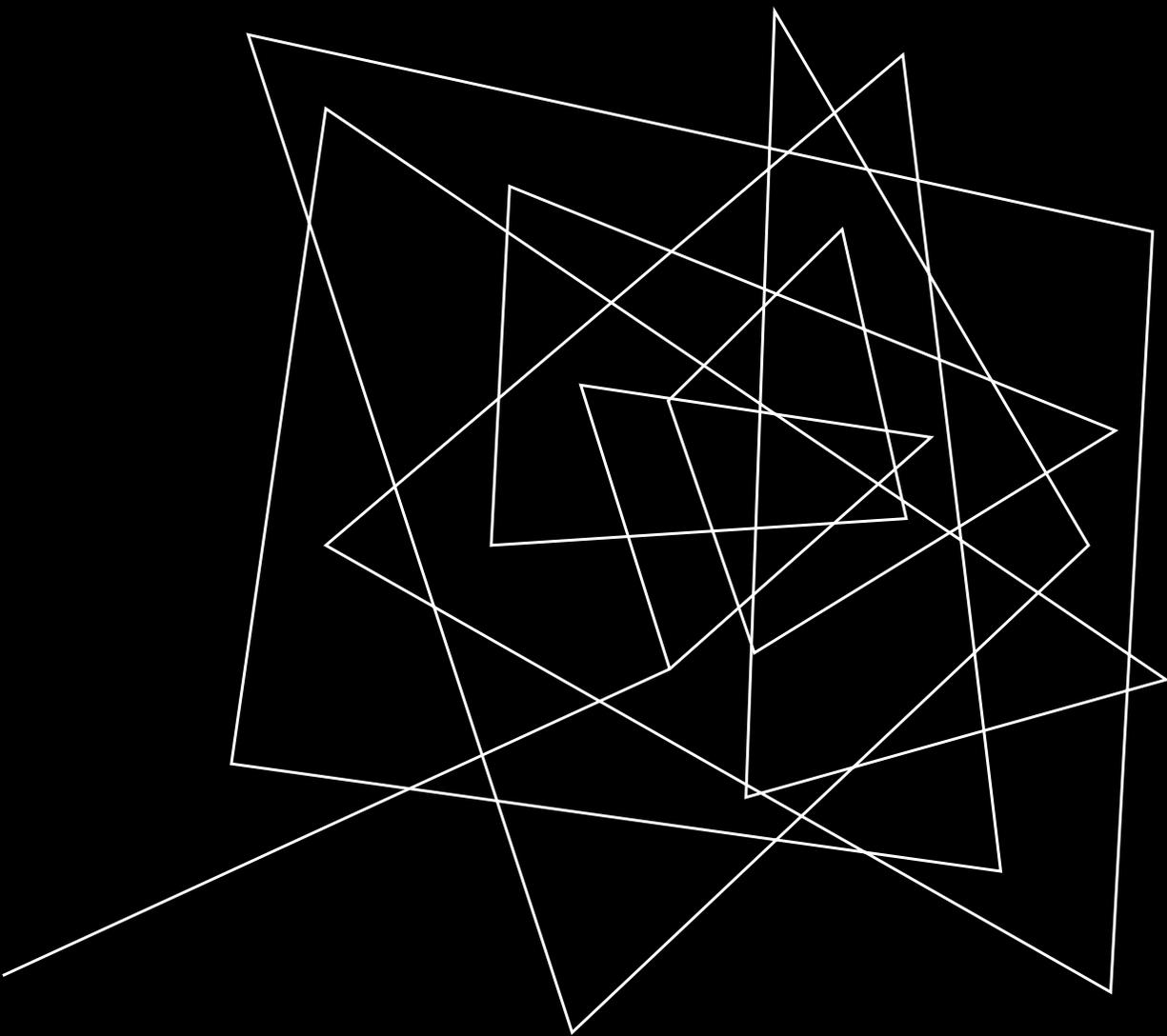
Looking Glass Factory makes:

- autostereoscopic display devices

- can easily be seen by <u>multiple</u> people situated at different angles simultaneously.

- services to convert 2D images to 3D for play on their devices

HISTORY

- Founded in 2014

- in Brooklyn NY with operations in Hong Kong.

- Launched Looking Glass Portrait in 2020

- Since then, have launched 2 other displays and a third is to be released.

- Also developed Blocks… a way of looking at holograms on a 2D display.
  - See https://blocks.glass

TECHNICAL SPECS

For the Looking Glass Factory Portrait

PORTRAIT SPECS

- 7.9" screen (6.1 x 4.5-inch)
- Powered by USB cable
- view images within a 58-degree cone.
- Image can have between 45 and 100 views
- Controls
  - A button for on/off AND switching to standalone mode
  - 3 buttons for forward, back, pause.
  - a button to brighten the frame LED light
- Input: HDMI, a USB-C, and aux/audio port
- Internal speakers… can play short videos.

LANDSCAPE DISPLAYS: 16" (soon), 32", and 65"

SOFTWARE UTILITIES (MAC/PC)

Looking Glass Studio
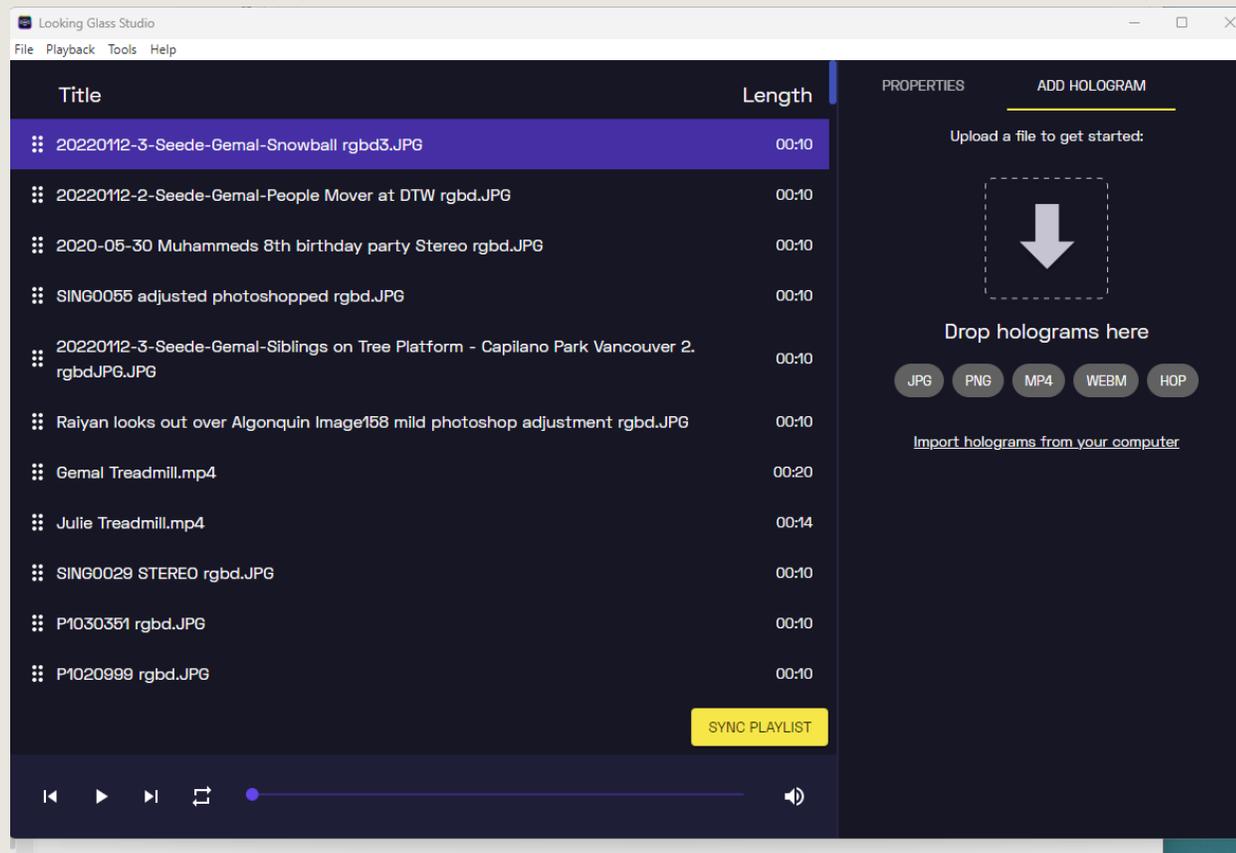
- Looking Glass Bridge – <u>must</u> run this to communicate between computer and device

- Looking Glass Studio
  - Drag files to the right side and they show up on the left
  - preview 3D images and videos on device
  - Can save the images onto device if desired

SOFTWARE UTILITIES: MISCELLANEOUS

- FFMPEG –
    - free open-source image conversion software that is included
    - command-line utility used to convert image sequences or videos into a video for Quilt

- Diorama
    - Very nice but discontinued software application.
    - Still available for free download
    - edit and enhance 3D images with backgrounds, text, and special effects into a WEBM file.
    - Must install the old driver… HoloPlay Service instead of new Looking Glass Bridge

- Plugins for developers that use 3D software applications like Unity, Unreal, Blender, WebXR

- StereoPhoto Maker has support for Looking Glass devices

SOFTWARE UTILITIES: STEREOPHOTO MAKER

3D image files need to be converted before they can be viewed on a Portrait

In StereoPhoto Maker:

- Edit>Depth Map >Create Depth Map from Stereo Pair…. This allows a stereo image to be converted to a 2D image and a depth map

- Edit>Looking Glass> … several functions for multi-conversion of files, and calibration of the device

StereoPhoto Maker
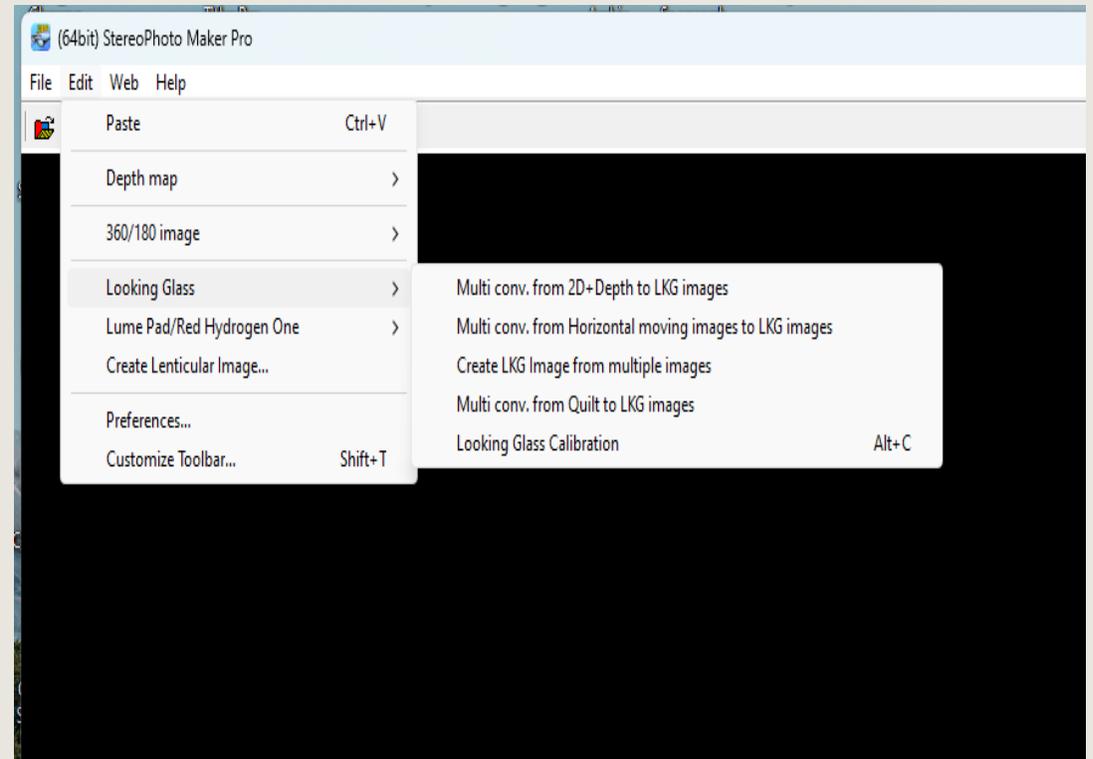
EXAMPLE OF 3D CONVERSION TO 2D+DEPTH MAP

CAPTURE DEVICES AND FILE FORMATS

Capture devises

- any 3D camera

- 2D camera capable of generating a depth map. E.G iPhone via Portrait Mode

  - transfer to the computer via direct cable or cloud services.

- 2D camera mounted on a rail.

File formats

- jpg, png, mp4, webm, and HOP

- HOP is proprietary, saves playlist

HOLOGRAM TYPES

| Depth Photos/Videos	Light Fields	Quilts	3D Models
2D + a depth map	Image sequences	Compressed Light Fields	Uses plugins for popular 3D packages
	Uncompressed		Models can be viewed directly on the device
	Highest-quality Holograms		Stereographic images can be captured
	Should be 4k		
	Should use 45 to 100 images		

ABOUT LIGHT FIELDS

Light Fields… the highest quality holograms

- Equivalent of a "raw image".
- Diminishing returns to including more than 45 images, and above 100 images,
- Image size should be 4k resolutions 3840 x 2160.
- The images should be captured while moving at a constant speed using a camera rail or slider, or in a 3D software package
- To determine the distance to the subject taking into account the camera field of view and travel length.
    - $Tan(cameraFOV/2) = (Travel/2)/distance$.
    - A 38mm lens has a 58-degree field of view, so the travel = 1.1 x distance.
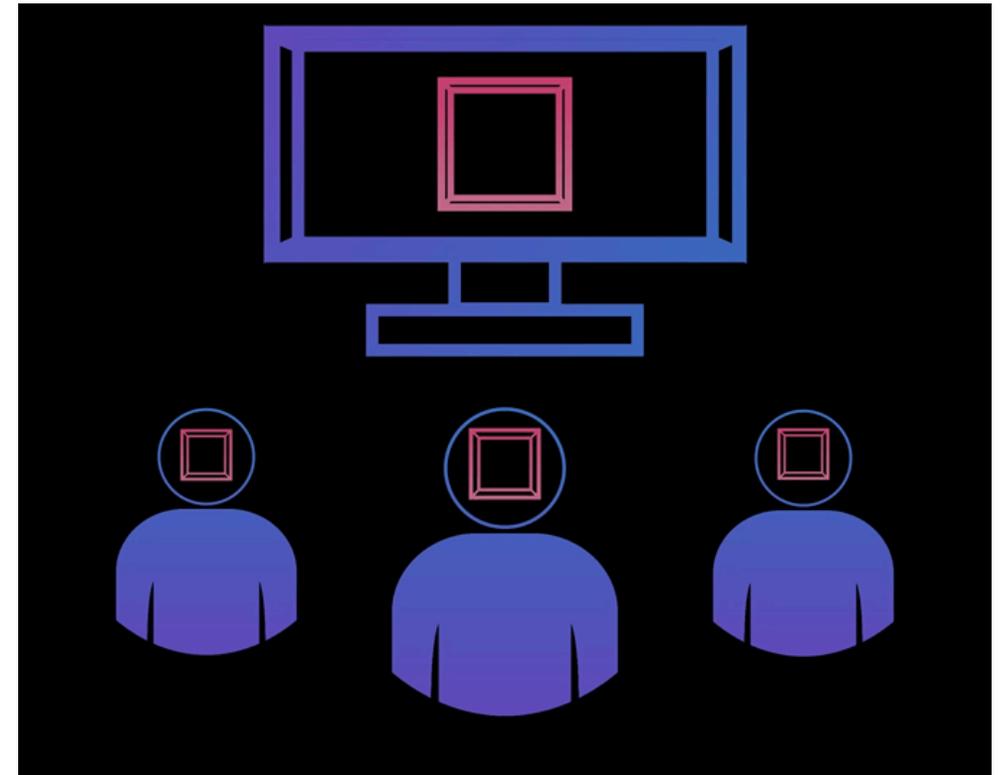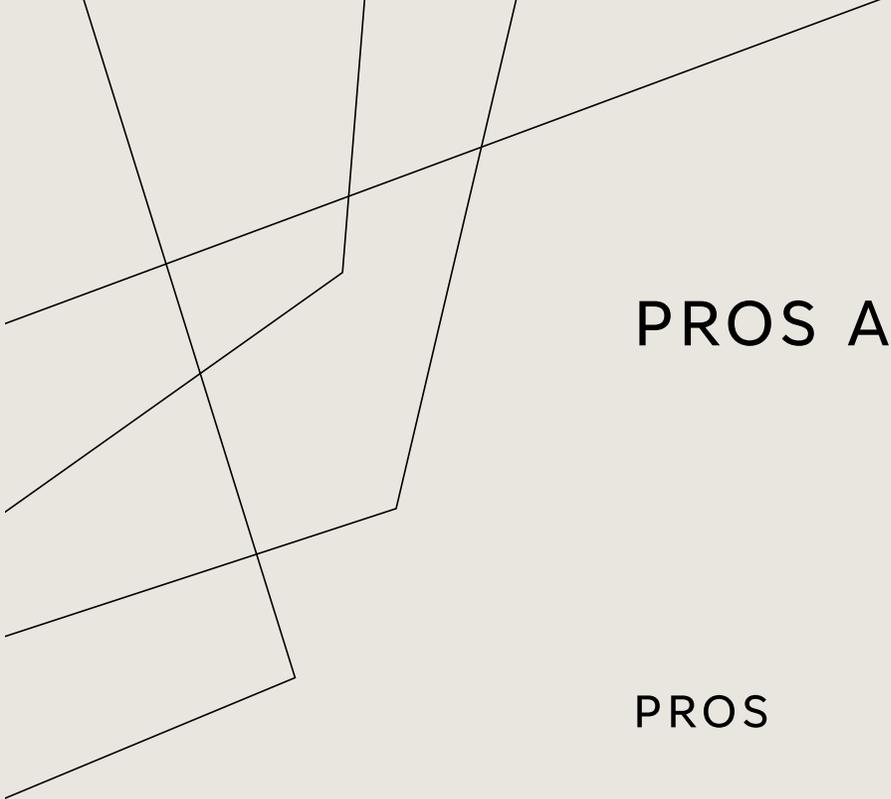
PROS AND CONS

PROS

- No glasses,
- several people can view it simultaneously
- simple to use
- Images taken on a rail have exceptional cohesion from different angles

CONS

- Cost
  - $400, $6000, $20000, $80000 for the different devices
- No wireless capability. You have to load photos by connecting to a computer

THANK YOU

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