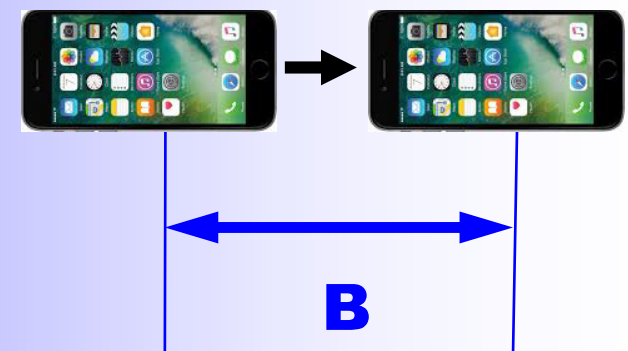# More Phone 3D

## Tips & Tricks for using your phone for 3D

By George Themelis
Detroit - April 2024

# Different Types of Phone 3D

- **3D phone**

- **Twin phones**

- **Use two built-in Phone Lenses**

- **Use a beam splitter**

- **Use depth information that the phone records**

- **Use sequential ("cha-cha") shots**



i3DPhotoCam

Kula Bebe

B

# Phone 3D Advantages

- **Always with you**
- **Unobtrusive**
- **Apps**
  - Measure Deviation
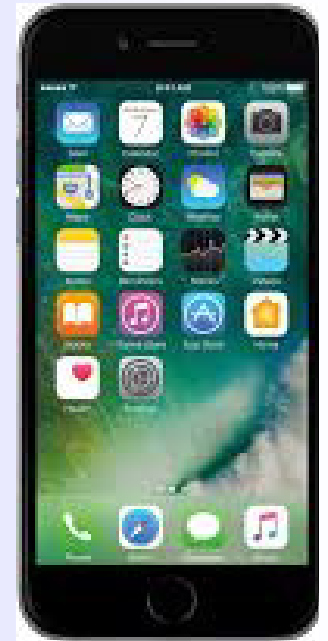  - Displays 3D
  - Take full control (2D)
- **Flexible stereo base**
- **Small Lens** (has some advantages)
- **Durable** (water & shock resistant)
- **Powerful image processing**
- **Continuous improvements**

# Subjects for phone 3D

- **Buildings** / **Architectural Details**

- **High rise Cityscapes**

- **Landscapes / Nature (without wind)**

- **Aerial 3D hyperstereos**

- **Museums**

- **Low light** / **night photography**

- **Tabletops**

- **And lots more!**

I did an informal counting, and concluded that 50% of the images entered in our 3D competitions have no movement and could have been recorded with a single camera

There is a whole universe of people (Facebook, Instagram) who only use a phone for their 3D photography

# Phone 3D Limitations / Concerns

- **Stationary Subjects (?)**

- **Flexible but advanced**
  - Alignment
  - Deviation
  - Post Processing

- **Cost**
  - New iPhone 15 (2024) ~ $1000
  - Used iPhone 13 (2022) = ~~$1,300~~ = < $500
  - Used iPhone 7 (2016) = $50-$100

- **Lacks camera controls**

- **Image Quality**
  - Small Fixed Lens (no zoom)
  - Small Sensor
  - Cannot escape laws of Physics
  - Makes up with post processing

# Tips for Phone 3D Photography

**Basic**

- **How to Hold the Phone**
- **Turn ON grid** / **level**
- **Adjust exposure**
- **Change Color Balance** (when needed)
- **Utilize all available lenses**

**Advanced**

- **Use apps to get deviation (depth) information**
- **Portrait Mode** (for DOF control)
- **Night Mode**
- **Live Mode & Long Exposure**
- **Burst Mode**

# Android vs. iPhone

- **I have an iPhone**

- **Everything that can be done on an iPhone can ~~most likely~~ (for sure!) be done on an Android phone**

- **Google is your friend**

# Tips for Phone 3D Photography

- **How to hold the phone? (horizontal vs. vertical)**



**VERTICAL** ❌     **HORIZONTAL** ✅

donors1.org
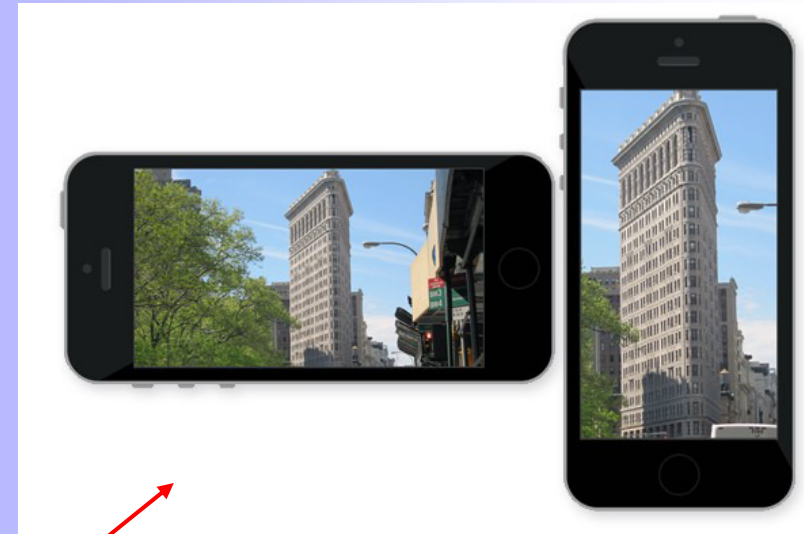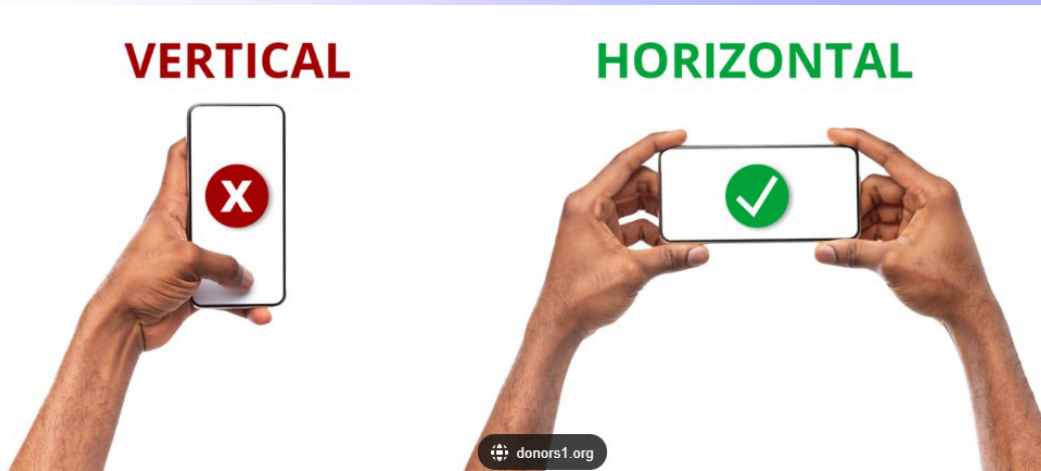


## Why do photographers shoot vertical?

Photographers shoot vertical usually for composition considerations, sometimes out of spatial constraints, and also to work with requirements in final usage of the photos the last being the most defining factor of all.
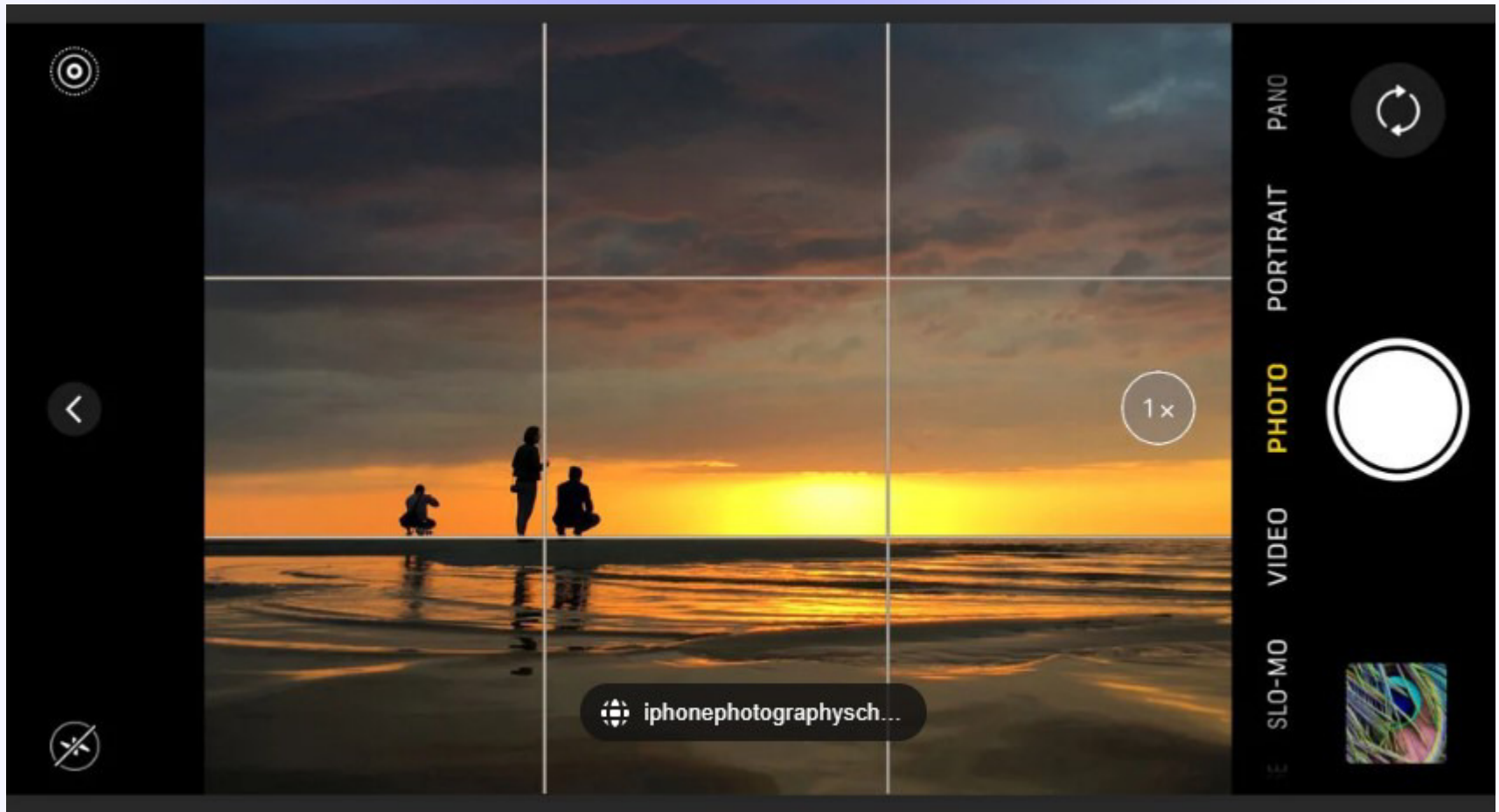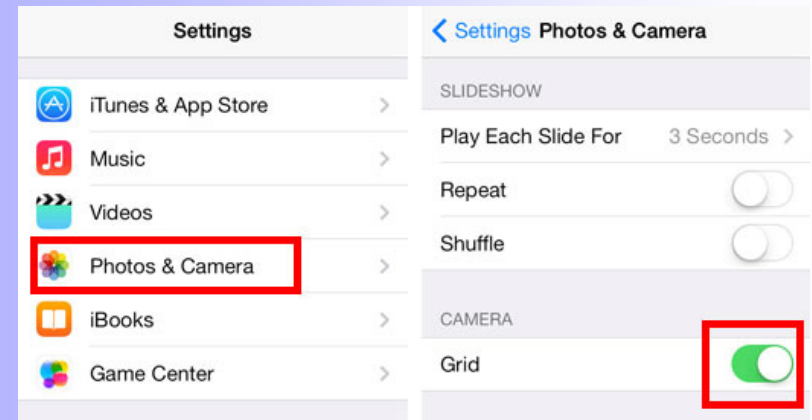
**1920x1080 (16:9 aspect ratio)**

# Tips for Phone 3D Photography

- **Turn ON grid / level**

# Tips for Phone 3D Photography

- **Learn how to adjust exposure**

# Tips for Phone 3D Photography
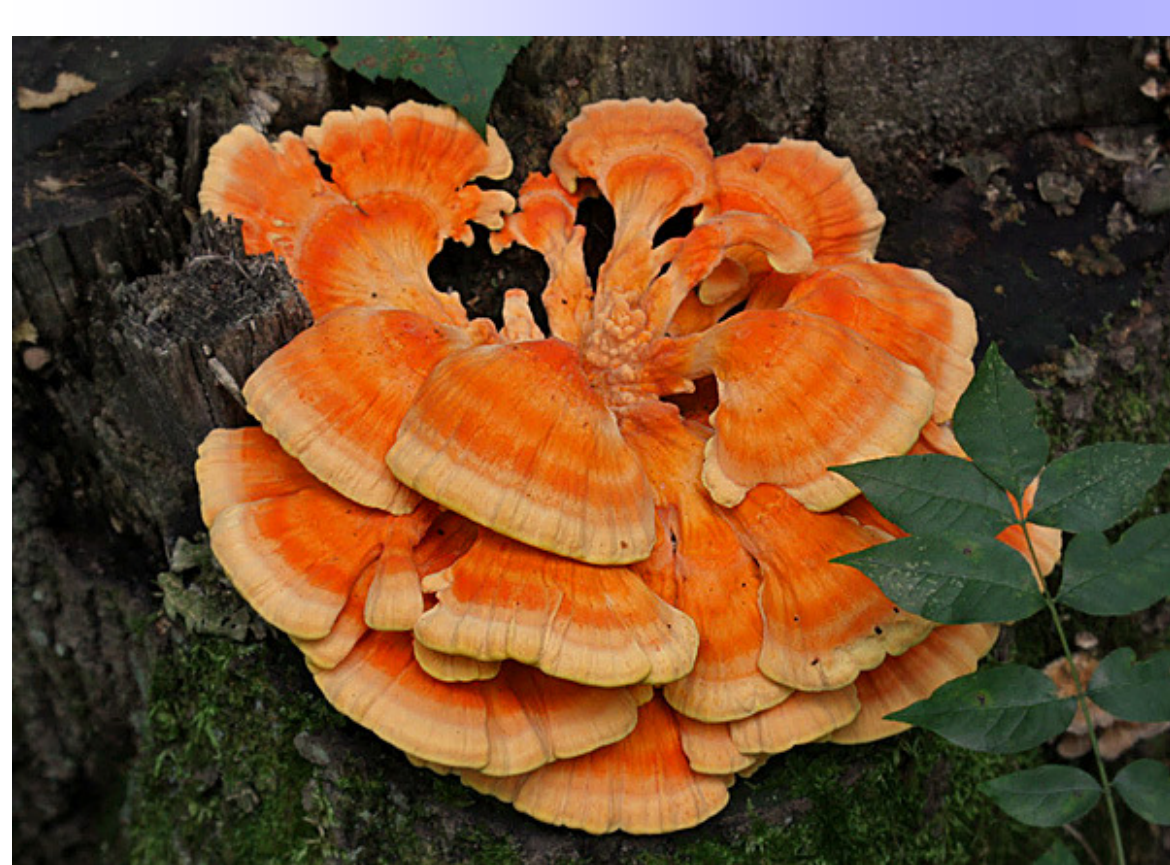
- **Change Color Balance** (when needed)

# Orange Mushroom Frustration
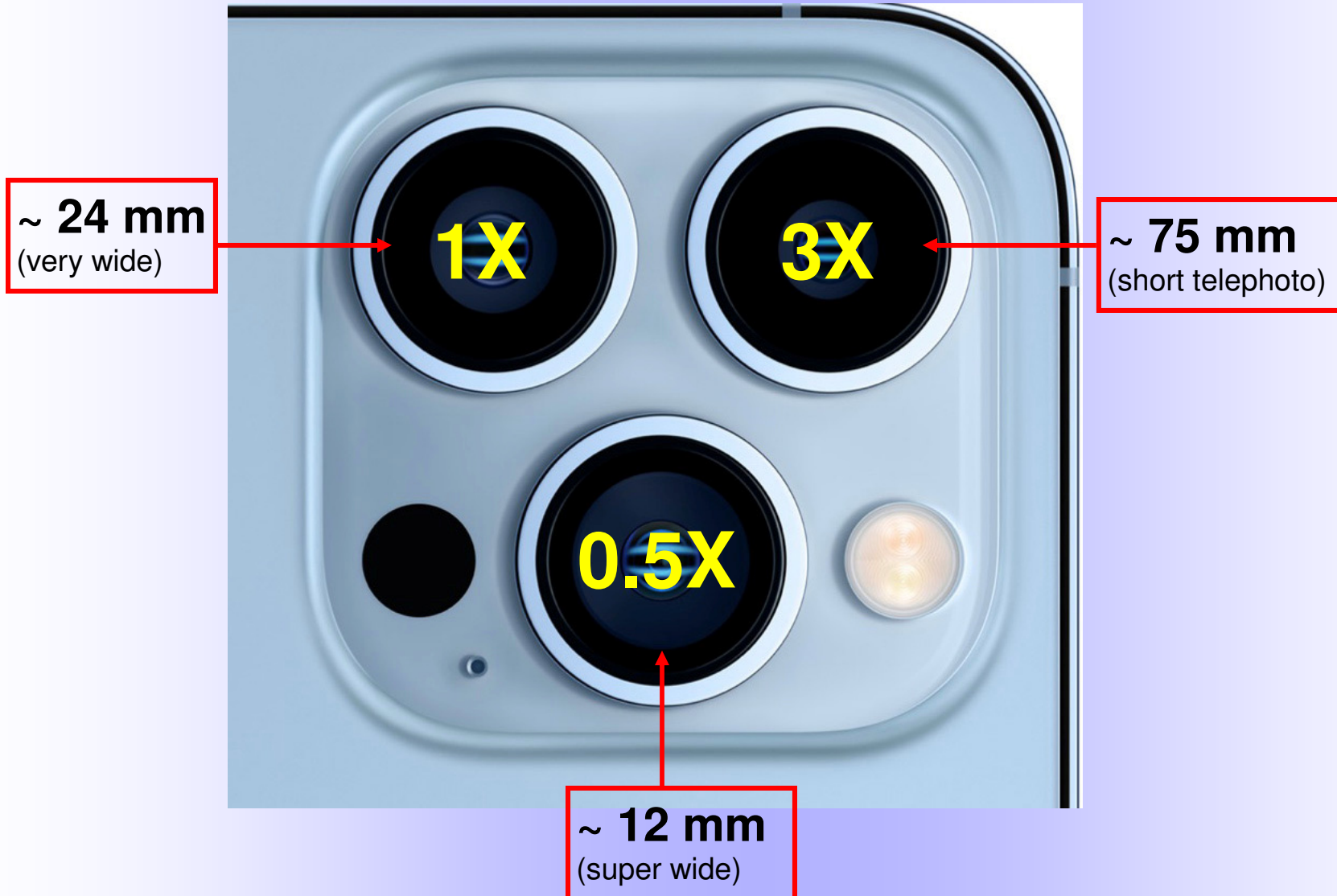
(simulated)

What my eyes see
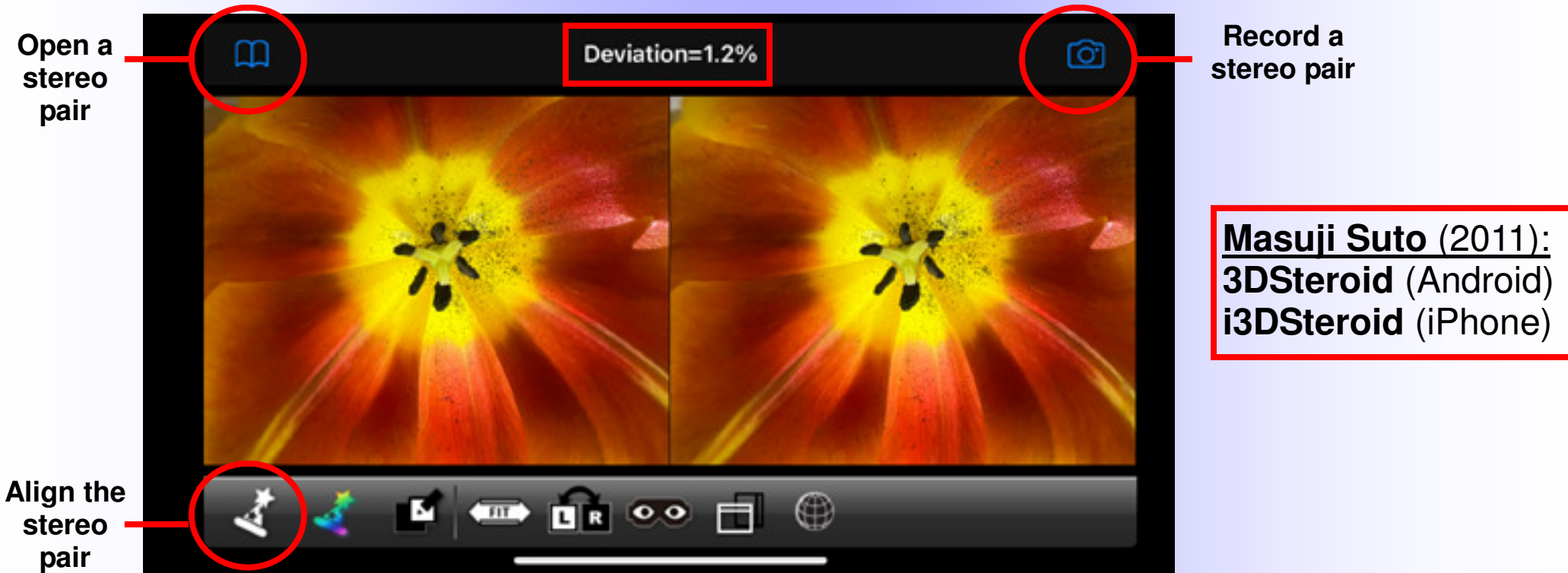
What the phone records

# Tips for Phone 3D Photography

- **Use all available lenses** (experiment)

**iPhone 13**



~ **24 mm** (very wide) → **1X**

**3X** ← ~ **75 mm** (short telephoto)

**0.5X**

~ **12 mm** (super wide)

# <u>Tips for Phone 3D Photography</u>

- ## Use apps to get deviation (depth) information

**Open a stereo pair**

Deviation=1.2%

**Record a stereo pair**

**Masuji Suto** (2011):
**3DSteroid** (Android)
**i3DSteroid** (iPhone)

**Align the stereo pair**

- <u>Record</u>: After you take the first picture, you see an **outline** (ghost image) of this picture which helps with the alignment of the second picture.

- After you take the 2<sup>nd</sup> picture, you can see the stereo pair on the screen (freeviewing might be required, but other options + viewers are also available)

- After **alignment** see a value for the **deviation**, which can alert you that something might be wrong (too much/little shift/depth). **I recommend a deviation range of 1.5 to 2.5%**. 3% is consider maximum for projection.

- <u>Note</u>: You do not need to take the pair with the app in order to view it in 3D or measure the deviation. You can open an existing stereo pair.

# Tips for Phone 3D Photography

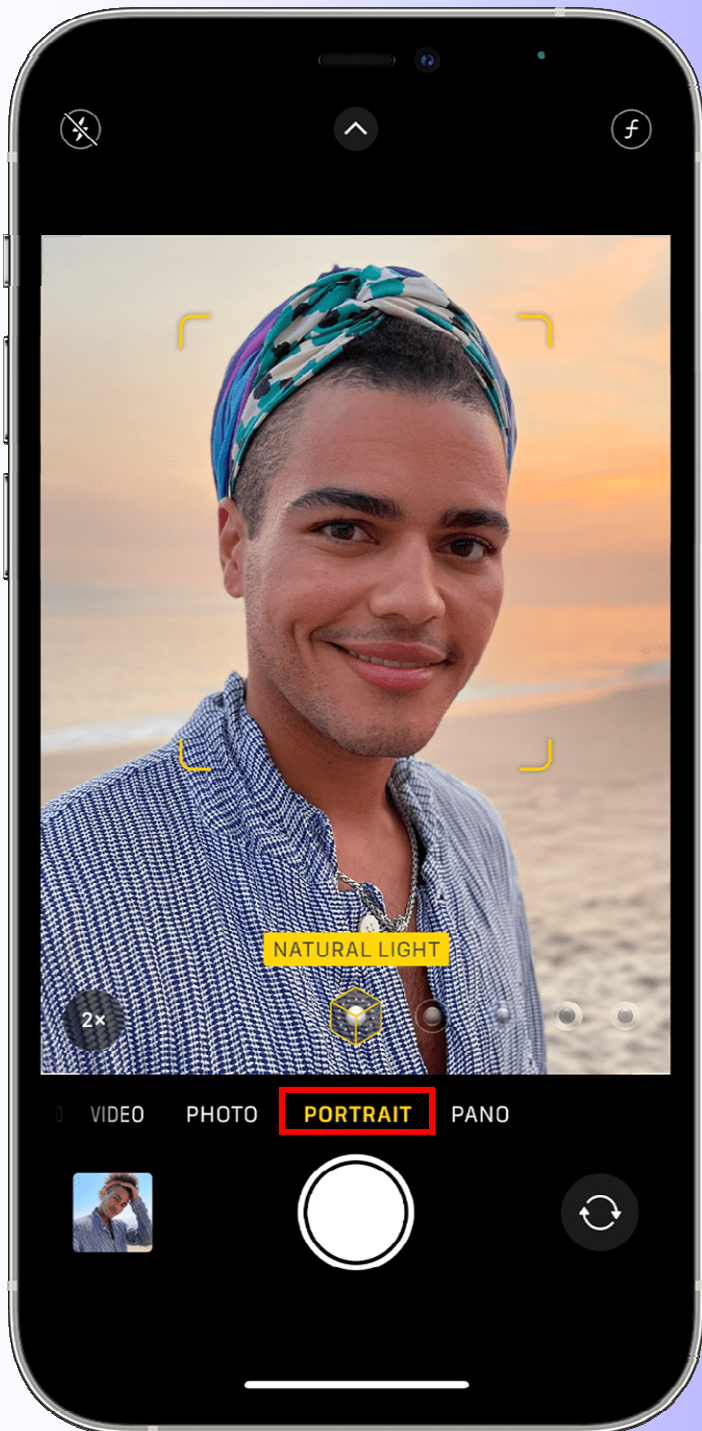- ## Try portrait Mode (for DOF control)

What Is Portrait Mode?

Phone creates a depth-of-field effect that **blurs the background digitally**.

This simulates effect of lenses on larger cameras, through the change in aperture (small apertures f16 → large DOF, wide apertures f1.4 → narrow DOF)

**LiDAR scanner**

# Portrait Mode



DEPTH — OFF

DEPTH — f1.4

Portrait   Adjust   Filters   Crop

VIDEO   PHOTO   **PORTRAIT**   PANO

NATURAL LIGHT

2×

Interesting Fact

**After you take the portrait photo**, **you can adjust the "out of focus" effect** (the phone offers a choice of f-stops, from f1.4 to f16, simulating a real lens, or no effect at all).

Top Left: No effect

Top Right: Strongest effect (f1.4, wide open aperture)

# Tips for Phone 3D Photography

- **Try Night 3D Photography**



Tony's apartment: "Corncob" towers
(Marina City, Chicago)

I went to the rooftop and took pictures with my iPhone

I expected nothing good:

- Blurred pictures (result of slow shutter speed)

- Grainy pictures (result of high ISO)

**I was surprised that the pictures were sharp, well exposed and with low noise**

How is this possible??

# iPhone Night Mode

## Night mode:

- Camera takes **multiple exposures** over **several seconds**

- It then **blends these images** into a single, high-quality photo (**sharp**, **balanced exposure**)

## iPhone Implementation

- Night mode comes on **automatically** when the iPhone detects that the light is low. When this happens, a **yellow moon icon** appears at the top left of the screen

- If the icon is white, the iPhone is suggesting you could use Night mode to improve your shot. To activate Night mode, tap the white Night mode icon so it turns yellow.

- The **number** in the Night mode icon indicates **how long** it will take to capture the photo

- Ttry to **hold the phone still** during the exposure time

- As soon as the exposure is finished, the phone blends the images together to create the Night mode photo

- You can **adjust** the automatic exposure time that the iPhone sets

# Night Mode in Various Phones

**iPhone**:

- The Night mode is available starting with **iPhone 11** (for the 1x camera) and up to the latest model (iPhone 15 using all three cameras, 0.5x, 1x, 3x).

- For more details, check Apple's web site

**Android Phones**:

**8 Tips to Take Better Photos at Night With Your Android Phone**

- 1. Tap into Your Phone's Night Mode ...

- 2. Use Your Phone's Manual Mode ...

- 3. Try a Third-Party Camera App ...

- 4. Take Advantage of the Available Light ...

- 5. Use the Self-Timer ...

- 6. Try Motion Modes (If Available) ...

- 7. Shoot in RAW ...

- 8. Edit Your Photos ...

8 Tips to Take Better Photos at Night With Your Android Phone

m www.maketecheasier.com/take-better-photos-at-night-android/

Certainly! Night photography with your Android phone can yield stunning results. Here are some tips and tools to enhance your nighttime photography:

1. **Use Night Mode**:

   - Many Android phones come equipped with a dedicated **Night Mode** feature. This mode optimizes settings for low-light conditions, allowing you to capture better photos even in the dark. Look for it in your camera app settings.

2. **Adjust Exposure**:

   - Most smartphones have a built-in exposure lock. Use it to adjust the exposure manually. Experiment with longer exposure times to capture more light.

3. **Chase Available Light**:

   - Compose abstract photos by capturing available light sources. Streetlights, neon signs, or reflections can create interesting effects.

4. **Stabilize Your Phone**:

   - Night shots can be prone to blurriness due to shaky hands. Use a tripod or stabilize your phone on a flat surface to avoid camera shake.

5. **Explore Manual Mode**:

# iPhone Night Mode - Final Thoughts

The beauty of the Night mode for me is that you **do not need a tripod** or solid support.

Thanks to the phone's **image stabilization**, plus the **multiple exposure** feature, you can handhold the phone and still get sharp pictures under low light.

Just make sure to hold the phone steady. (If you shake the phone while it is taking the picture, or if the subject moves, the pictures will be blurred.)

Night Mode Drawbacks?

I have noticed that when I take **portraits** under low light (indoors, for example), the skin tones look **unnaturally smooth** and lacking details, as if the subject is wearing heavy makeup, something that I do not like. I am sure that this is the result of the **noise reduction**.

# Tips for Phone 3D Photography

- ## Experiment w/ Live Mode & Long Exposure

<u>With Live Mode on</u>:

- Phone takes a short (**3 second**) "video"

- 1.5s before and 1.5s after you tap the shutter

- At 15 fps = 45 pictures total

- These play as a short video

- You can select any of these for your main (key) still picture (the center one is selected by default)

- **You can change the "live effect"** by tapping at the live icon. You then get these options
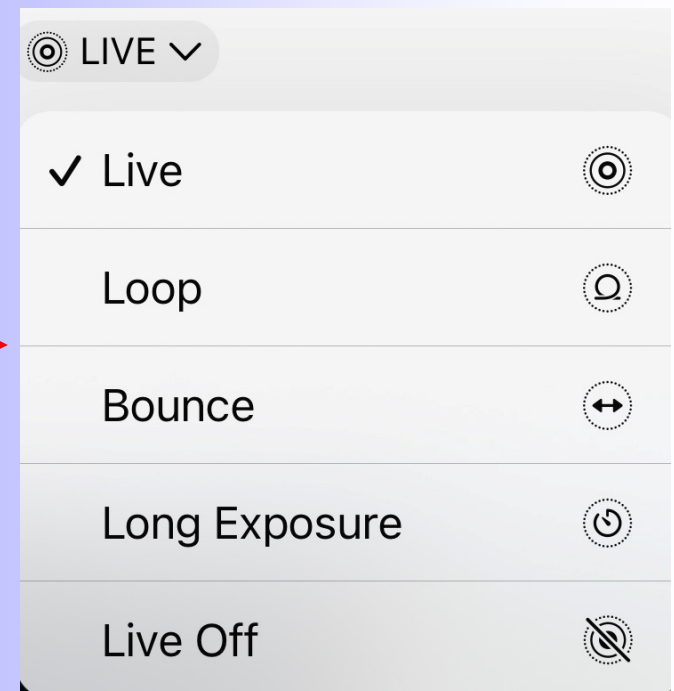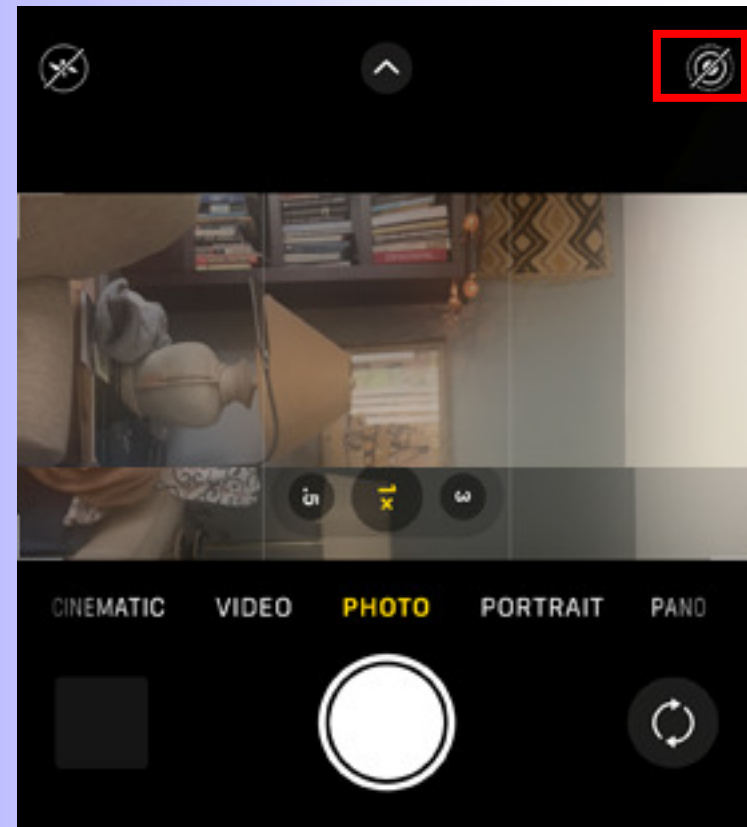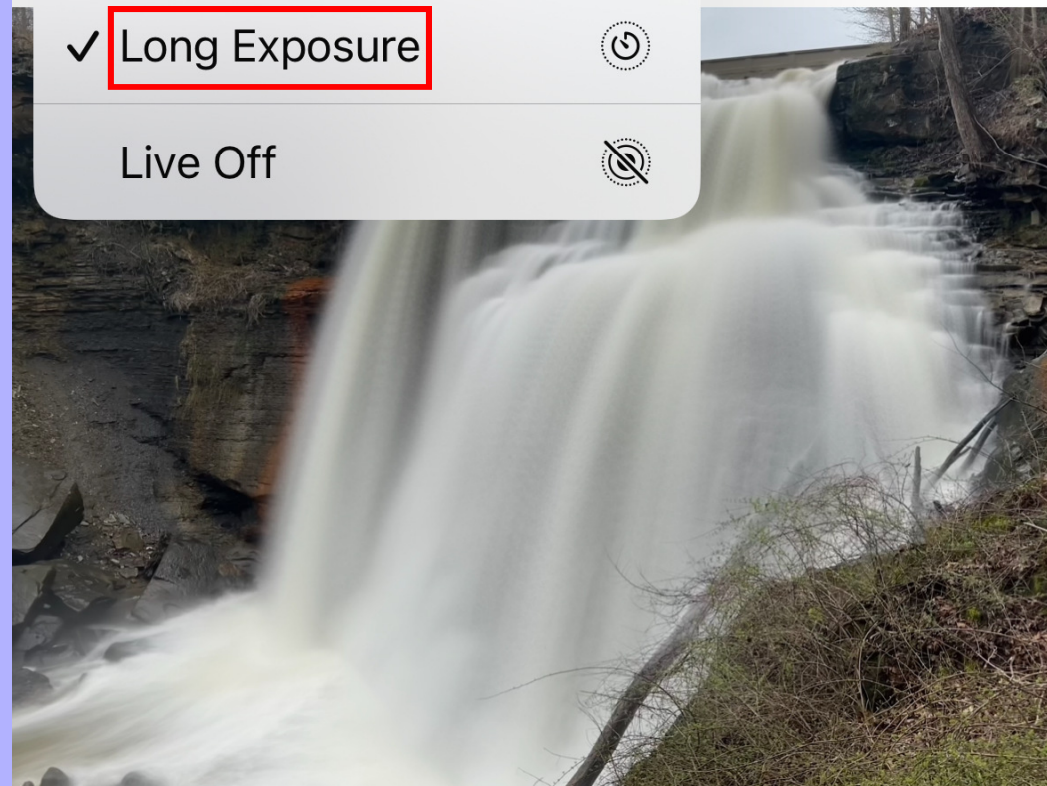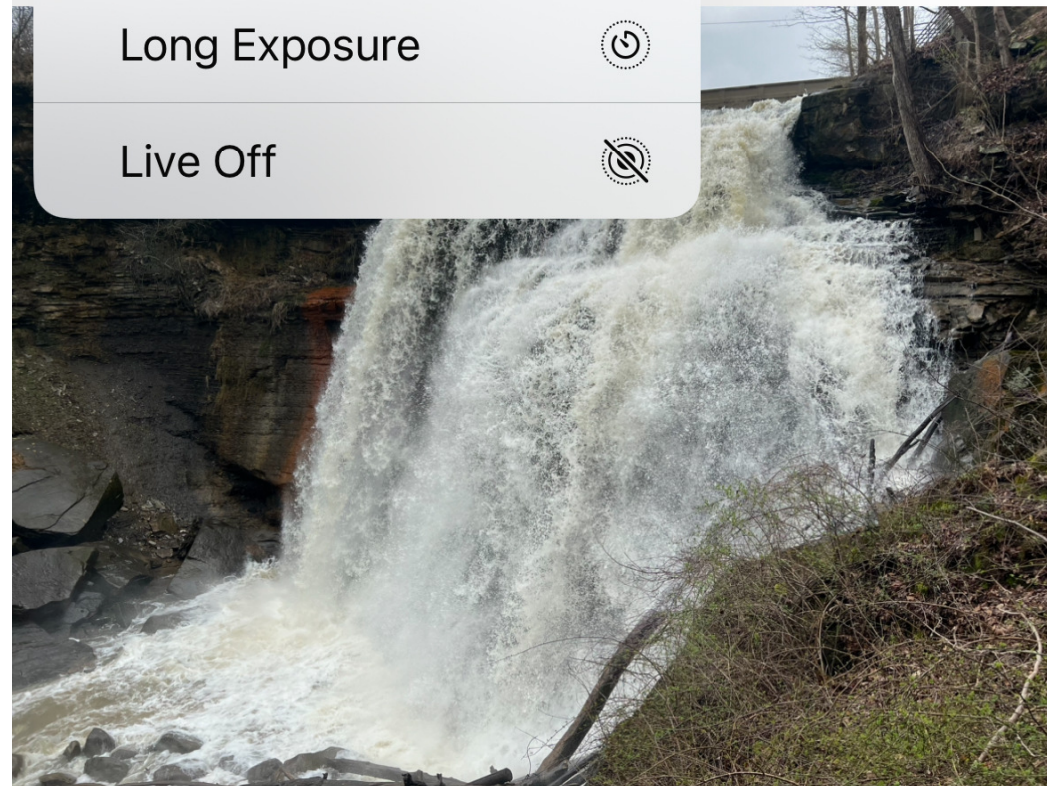
# Live Mode & Long Exposure

# Live Photos on Android Phones

Live Photos is an iPhone-exclusive feature, but there are different ways to achieve this functionality on Android [1] [2]. For many users, there might even be a Live Photos analog built into their phone [1]. However, for everyone else, there are a couple of great apps that can capture sharable moving images and still photos [1]. Samsung Motion Photo is one such app that is available on newer Galaxy phones [1]. Another app that can be used on Android is Live Wallpapers, which allows you only to set your moving picture up as your wallpaper [2].
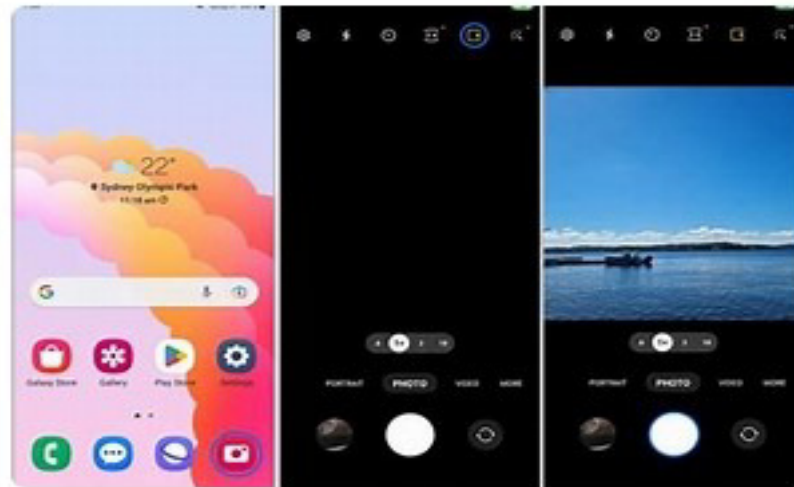
AnyRec
https://www.anyrec.io/live-photo-android ▾

## 4 Ways to Do Live Photo on Android 14 (Samsung & Pixel) - AnyRec

### Part 5: FAQs About Live Photo on And...

1. 1. What are the recommended live photo apps for Android? When you open Play St...
2. 2. How to do Live Photos on iOS? Open the Camera app on your iPhone and ensu...
3. 3. What is the file type of Live photos on Android? The usual for... See more

### Part 1: Use Motion Still to Take Live P...

Motion Still is an app dedicated to Android devices. It captures video clips that you can edit to awesome cinemagraphs and GIF files. With just a simple tap, the app

### Part 2: How to Take Motion Photos on...

The Live Photos feature is originally from iOS devices, but some upgraded Android phones also have integrated this tool. Depending on the brand, Live Photos can

# Tips for Phone 3D Photography

- **Try Burst mode**

- Burst mode: Camera takes pictures quickly (**10 /sec**)

- Very easy to implement on iPhone (swipe shutter button to the left to start exposures, lift finger to stop)

- You can select what photos to keep from the burst sequence



- Official use: "Use Burst mode to capture a moving subject, or when you want to take multiple high-speed photos so that you have a range of photos to choose from."

- 3D Uses?

# Phone 3D
## Using your phone for 3D

- Your phone can be your **2$^{nd}$ "stereo camera"**

- It's **always with you** & **does not attract attention**

- **Small lens** & **water** & **shock resistant**

- Used **sequentially** offers **flexible stereo base**

- **Lots of possibilities** (mostly stationary subjects)

- **3D Apps** help to **record** & **evaluate** 3D images

- **Image quality** is good & improves with time

- **Tips** to improve 3D photography with your phone

- If you are **serious** about Phone 3D, do your own research (Google, YouTube, on-line classes, etc.)