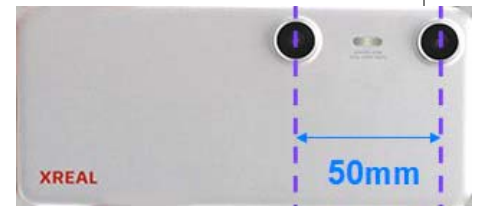


XREAL Beam Pro Tips

A Tutorial by George Themelis



This device is very new to us (I have had mine for about a month now) and it comes with no documentation. By corresponding with others (via the photo-3D email list and the XREAL Beam Pro User Group on Facebook <https://www.facebook.com/groups/474727928845639>) and experimenting with my device, I have learned a few things that I will summarize here. I will discuss the following:

- Physical Appearance & Controls
- Setting the Device
- Useful Accessories
- Recording Tips
- Composition Tips
- Exposure Control
- Viewing/Editing Tips

Physical Appearance/Controls

See **Fig. 1**. The most important is the power button. Pressing the power button turns the device ON and OFF. A very important shortcut is that **double-clicking the power button should bring up the camera**. If this is not working, go to the Settings > System > Gestures > Quickly open camera, and make sure that it is ON. If double-clicking the power button does not bring the camera

up, turn this setting OFF and ON again.

When the camera is on, you can take pictures by touching the shutter button on the screen, or pressing the orange button, or the volume button (up or down). You can also fire the shutter by using a bluetooth (BT) remote.

The device has two ports at the bottom. One (left, as you face the screen) is used to charge the device, the other is used to connect the company's glasses or connect to a computer to transfer data. To connect to a computer to transfer data (files, pictures), you need a **USB-C cord that allows data transfer** (some cords only have connections for charging and they won't work). The device does not come with a cord (or a USB charger). If you need these things, you have to buy them.

After you connect the cable to the computer, go under Settings > Connected devices > USB > and select "File Transfer." You will then see a folder popup "Internal shared storage." Open the DCIM folder and then the Camera folder. All the pictures and videos are stored there. The 3D pictures are named like this: SV_20240908_172655. This picture was taken in 2024 (year) 09 (month) 08 (date) 17:26:55 (time,

5:26:55 pm). The video files start with SV. 2D pictures start with IMG.

The device also has a tray for a micro-SD card. It can take cards up to 1T. I have been using the internal memory (I got the 128MB model) and after taking ~5000 pictures and videos I still have ~1/3 of internal memory left.

Setting the XBP

This device looks like a phone and it is configured as a phone, but we want to use it as a camera. With this goal in mind, here are some setting changes I recommend:

Under Settings > Display:

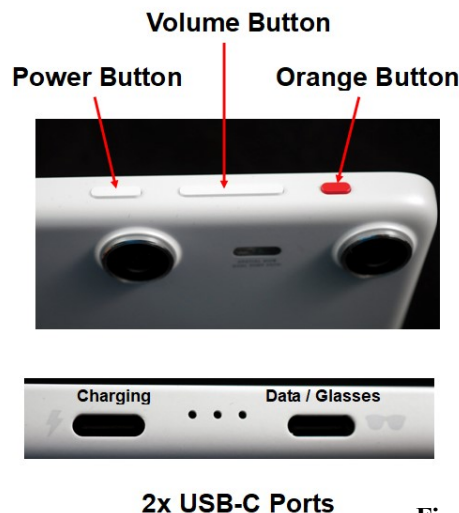
- Turn auto rotation ON
- Turn Adaptive Brightness OFF and put Brightness 100%
- Turn Double tap to wake up screen OFF (only pressing the power button will turn on the device).
- I also recommend changing screen timeout from 1 minute to 10 minutes (one minute is too quick for me)

Under camera settings: Bring the camera up and click at the Settings button in the upper right corner.

- Turn the Shutter sound ON if you like to hear the sound as a confirmation that you took the picture
- Turn the Grid lines ON (I personally find the grid lines too thick and don't have them on,)
- I have also changed the Video encoding to H.264 because some software does not work with H.265.

Useful Accessories

The only accessories that you really need is a USB-C cable and a USB power adapter. Most people already have these. I bought a few USB-C cables that also transfer data. I got them in blue color so when I see a blue cable I know it the right one.



Double-pressing the power button brings the camera up

Pressing (actually, releasing) the **orange button** or the volume up/down buttons fires the shutter



Micro SD Tray. The device comes w/128 or 256 GB internal memory. Can take micro SD cards up to 1T.

Fig. 1

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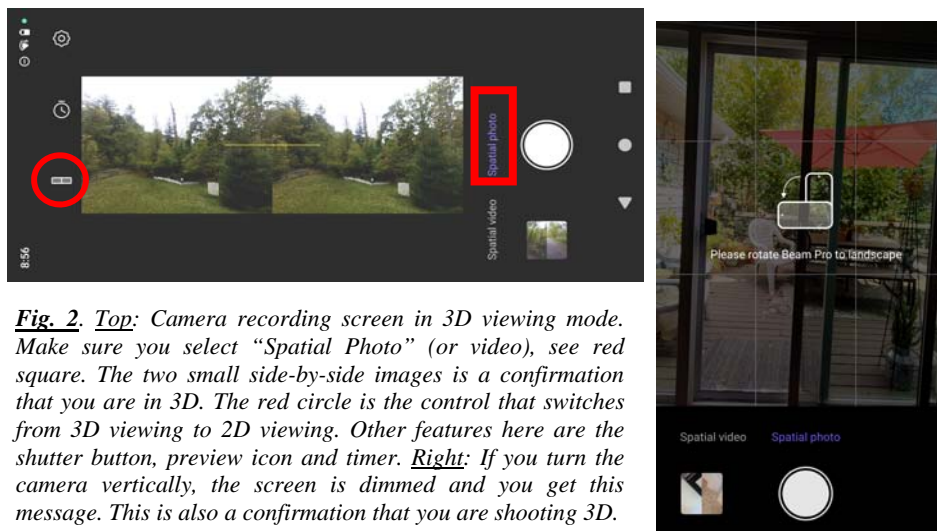


Fig. 2. *Top:* Camera recording screen in 3D viewing mode. Make sure you select “Spatial Photo” (or video), see red square. The two small side-by-side images is a confirmation that you are in 3D. The red circle is the control that switches from 3D viewing to 2D viewing. Other features here are the shutter button, preview icon and timer. *Right:* If you turn the camera vertically, the screen is dimmed and you get this message. This is also a confirmation that you are shooting 3D.

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Useful accessories include:

- A **case** to protect the device. You have the choice of clear or different colors. My favorite case now is black. The device is white and stands out so with a black case it is less conspicuous. This is the only accessory specific to the device (it has openings for the two lenses and the two USB-C ports). All other accessories are generic phone accessories.
- A selfie-stick is very useful. I have two: A compact one that serves as a handle, selfie stick or a short tripod. It also comes with a BT remote. A more sturdy one gives me more reach.
- A grip. In addition to being a grip, it offers a tripod socket, a BT remote shutter button and either a selfie-mirror or an LED light. Makes the device work more like a camera.
- Other accessories that people have used include mounts to attach the device to the body/head, underwater

cases, gimbals for smoother videos, etc. If you think you need it, someone is selling it.

Recording Tips

When you bring the camera up (double-click the power button), you are in the recording screen. First, make sure that you are in one of the 3D modes. The camera has 4 modes: Video, Photo, Spatial Video, Spatial photo. Only the “Spatial” settings are 3D. With experience you can tell if you are in the 2D modes, instead of 3D.

If you have installed the latest camera update, you have the choice of a **2D recording screen** (you see larger image of the left side) or a **3D recording screen** (you see two smaller side-by-side images). I mostly use the 3D screen and I sometimes freeview the image. Occasionally, I use the 2D screen to see details better. On either screen, the XBP takes 3D pictures.

An interesting and unique feature of the XBP is that if you hold it vertically,

the screen is dimmed and you see a message that directs you to rotate the device to landscape orientation. You can still take a picture, if you choose to do so.

If you use both hands to hold the device, make sure that the fingers of the left hand do not go over the left lens (same problem as with the Fuji). You can fire the shutter by either pressing the buttons (orange button or volume button) or by touching the screen. I often hold the device with my right hand only and use my pointer finger to touch the screen shutter button. This way my fingers never get in front of the left lens.

Composition Tips

Because of the ultra-wide angle lens, if you tilt the device up or down, straight lines will converge and objects at the corners will appear stretched. This is generally undesirable. Try to keep the device parallel and move up and down to change the composition. For example, if you are photographing something that is lower in the ground (children, pets, etc.) instead of standing up and tilting the camera, keep the camera parallel and squat or get in your knees to take the picture (see **Fig. 3**). To make sure that the camera is parallel, look for any straight lines in the back and make sure that they are parallel.

If you end up getting converging lines and corner stretching, you can use SPM’s Horizontal adjustment to correct (see **Fig. 4**). This correction crops the images, so it is always better to record the picture properly instead of trying to “correct” it later.

Since the device shows reduced depth (due to the combination of less-than-normal lens spacing and ultra-wide field of view, the XREAL BP shows ~1/3 of the depth of the Fuji) you must come closer to

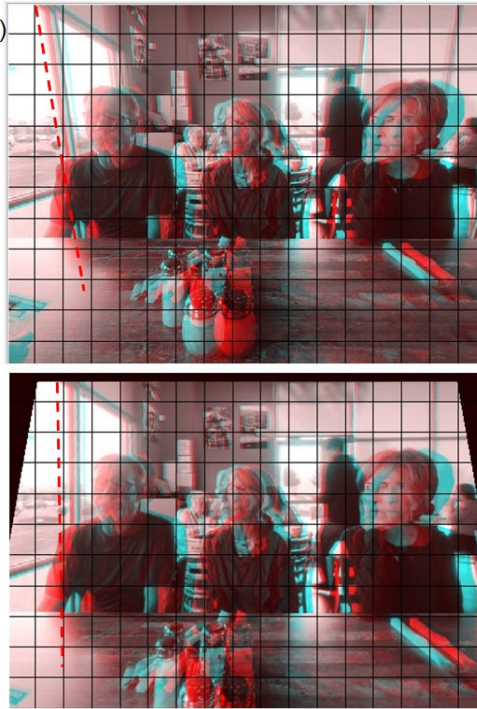
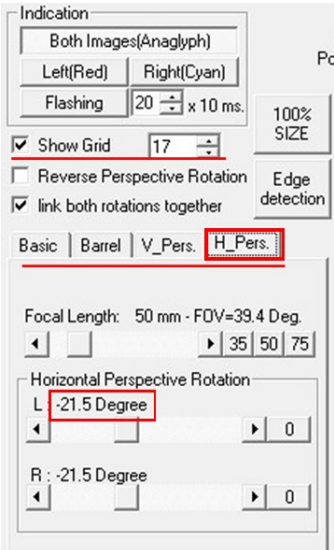
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Fig. 3. If you are photographing a subject that’s lower to the ground (children, pets), instead of shooting from eye level, tilting the camera down, lower the camera while keeping it parallel. This way vertical lines will not converge (left). Try also to come close.

SPM Easy adjustment (shortcut "K")

Not "easy" or intuitive but very powerful. Can correct rotation errors ("Basic"), vertical or horizontal perspective, and barrel distortion.



Slide the scale until the converging lines become parallel

Fig. 4. Using SPM's horizontal perspective adjustment, one can correct the vertical lines and make them parallel. The details are shown in this figure. This adjustment also removes the corner stretching of the faces. The image will be cropped after this adjustment. It is always better to compose correctly, instead of correcting later.

your subject. You can come as close as 2.5 feet (0.7m) with infinity in the picture. If you are taking close-ups (no infinity), you can come as close as 1 ft (0.3m), or even closer. My motto is "if you think you are close, get closer (and you can thank me later!)."

Exposure Control

The camera has fully automatic exposure. The aperture is fixed (f2.2) so only the shutter speed and ISO change. I did some testing which is summarized in Fig 5. As a rule, the camera favors lower ISO vs. faster shutter speed. If there is enough light, it uses ISO 50 (lowest value). As the light drops, the shutter speed drops (from a maximum of ~1/1000s to 1/100s). Then there is a transition area where the shutter speed decreases and the ISO increases as the light drops. When the light is very dim, the shutter speed bottoms out at 1/8s and the ISO reaches the maximum value of 3840.

What this means is that 1) you have no way to force a faster shutter speed to take action pictures, 2) when the light is low, be careful how you hold the cameras because the shutter speed can be very slow (~1/10s). Because of the very good stabili-

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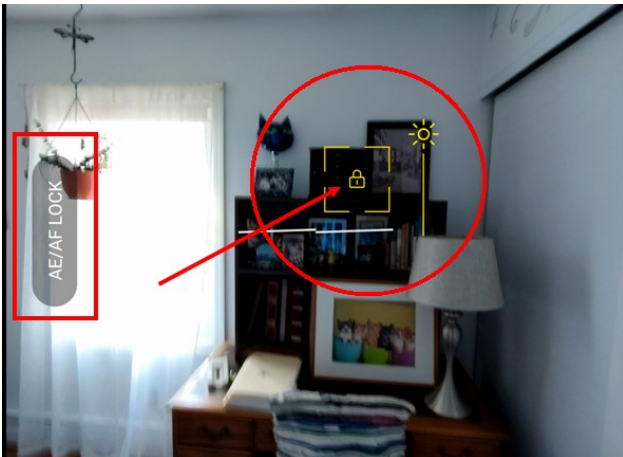
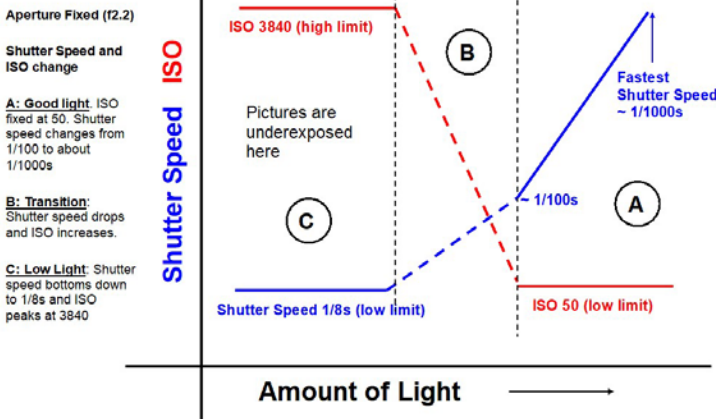


Fig. 5. The lenses have a fixed aperture (f2.2) so only the shutter speed and ISO change in automatic exposure. The program tends to favor low ISO and cannot be forced for high shutter speeds. Be careful when you hold the camera under low light. There is however exposure compensation. In 2D viewing mode touch the screen and hold it. This will lock the exposure (left). Then adjust the sun sliding scale. In the pictures above I reduced the exposure to record the sunset.



Fig. 6. After you record a picture, click at the preview icon to see it in 3D, either in landscape mode (above) or portrait mode (smaller images). You might see a suggestion (above) and act on it. Or you can always hit the Edit button and do more editing. There are a lot of options in the editing screen. When you are done, you can keep the original and save a copy.

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zation, with a little care, pictures will be sharp, but anything moving in the picture will be blurred.

Even though the exposure is automatic, there is an exposure compensation function (see Fig. 5). To use this you must be in the 2D viewing screen. Touch the screen at any point. The exposure is

adjusted for this point. If you hold your finger, the exposure is locked and can be manually adjusted by sliding the sun icon/scale.

Viewing/Editing Tips

After you take a picture, you can click the preview button to preview it. You can hold the device vertically and get a smaller pair or horizontally and get a larger pair. There are different ways to view the picture in 3D (freeview, use a simple viewer, use the company’s glasses, etc.).

You can also do some editing in the device. Click at the Edit button and explore different options. Sometimes, the device gives suggestions, for example “Brighten with HDR” (see Fig. 6).

In Conclusion

This camera might not be a good choice for quality landscape photography or anything that requires a longer base, longer focal length, or control of the shutter speed. I would use my twin cameras in those situations. But it is great for spontaneous, creative and fun 3D photography, especially in confined areas. It is also good for travel and street photography, 3D documentation, 3D video (“the easy way”) and many types of 3D. You can do all that with something that fits in your pocket. See some more examples in Fig. 7.

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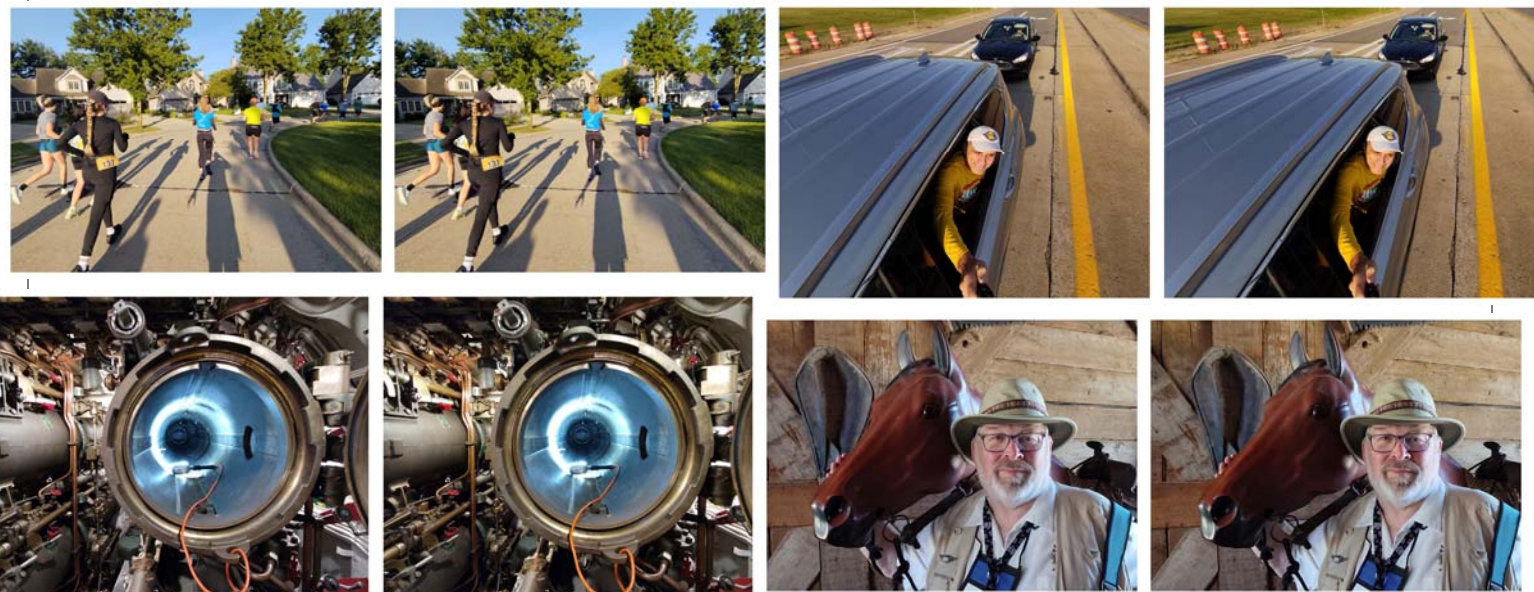


Fig. 7. Small sample of XBP pictures. I have taken the camera running a marathon, inside a submarine, taking creative pictures, and, even though it is not a great choice for portraits, it can take decent portraits with a little care.



Stereo Views



3D Video - The Easy Way

I am highjacking Jay's column to talk about one of *his* favorite topics, 3D Video.

3D Video – My Background

I have always had a love/hate relationship with 3D video. I own 4 different Sony 3D video cameras: TD10, TD20, DEV5, and DEV30. I have only used these occasionally and avoided taking them in my photo trips because they are big, heavy and my focus is on 3D still photography. I can also take 3D video with my stereo cameras, like the Fuji W3 or the Panasonic 3D1, and I have taken some video with the 3D1, but, again, only sporadically because of my lack of interest and my focus on still 3D photos.

One of my favorite 3D video projects was documenting the development of a paper wasp nest on my garage door with the Sony TD20 (stereo base = 20mm). Unfortunately, I did not do much with the 3D video I have taken, other than watching it on my TV and entering a couple of our 3D video competitions. I used the Magix software to put slide shows together but did not have time to learn how to edit 3D video.

Enter the XREAL Beam Pro

All this changed, practically

overnight, when I got my XREAL Beam Pro camera a month ago. Now I shoot 3D video almost every day, and I am ready and eager to show it to our club and enter our 3D video competition.

Here is why:

- 3D video with the XREAL Beam Pro (XBP) is **extremely easy** to shoot. It's just like taking 3D pictures ("Spatial Photo" in XBP's terminology). You just select "Spatial Video" and you are ready to shoot 3D video. The XBP treats 3D still pictures and 3D Video in exactly the same way,
- Just like the still 3D pictures, 3D video is **perfectly aligned** (except for the stereo window). It is also very nicely **stabilized**.
- The effective focal length when shooting 3D video is **~35mm**, which is easier to work with, compared to the ultra-wide 18mm EFL of the still pictures.
- The **3D video format** is very simple: mp4 with two 1920x1080 frames next to each other. It is possible to use standard 3D editors to edit this video (you can do everything, except of course for 3D functions, like alignment, setting the stereo window, etc.).
- Some **editing** is possible on the device,

like crop, adjust exposure, change speed, and export a still 3D frame.

I have not heard anyone say anything negative about the 3D video from the XREAL BP and everyone agrees **that the 3D video capability alone is worth the price of this device.**

3D Video EFL

I would like to clarify the statement that the effective focal length (EFL) when shooting video is ~35mm, which is longer and more comfortable than the ultra-wide ~18mm EFL of the still pictures. The same lenses that take the still pictures also take the video. So the actual focal length does not change. However, the video crops the field of view, so the effective focal length increases (see Fig. 1).

If someone likes the EFL of the video, they can achieve the same field of view by simply cropping a 3D still picture. They can also export a frame from a video, but taking a still picture will result in higher resolution. The resolution of a video frame is 2x1920x1080. The resolution of a still picture cropped to the same exact size as the video frame, according to my calculations, is 2x2560x1440, which is 1.3x larger.

3D Video Editing

As I mentioned, some editing can be done on the device itself. This is shown in Fig. 2. Here are some of the things that can be done:

- Move the start and end points to isolate a section of the video (crop).
- Change the speed of this section.
- Export a frame. This is very easy to do: Pause the video and hit the button "Export frame" and the frame is saved as a side-by-side 3D still picture (3840x1080 resolution) together with all the other pictures. See examples in Fig. 3.

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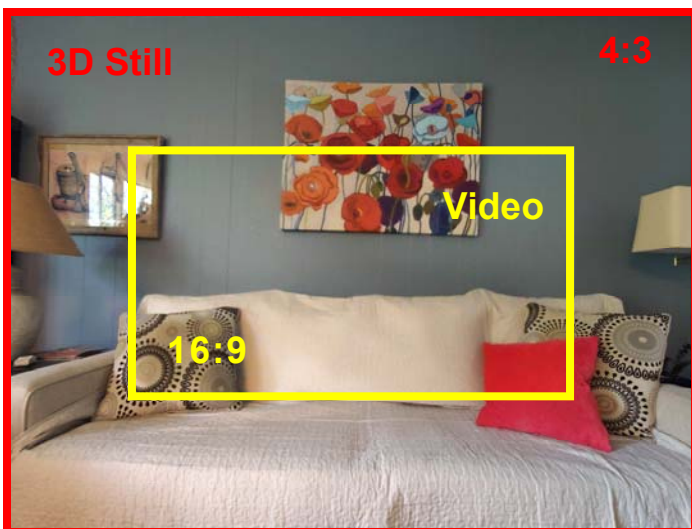


Fig. 1. This figure compares the field of view (FOV) of the still 3D picture (red) to a Video frame (yellow). The FOV of the video is more narrow, so essentially the effective focal length of the video is longer. The same lens takes both pictures only the cropping changes the effective focal length. The aspect ratio is also different.

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- If you hit the "Adjust" button then you can do all kinds of tricks, like adjusting the levels (brightness, contrast, etc.). These changes are applied to every frame of the video.

During my long flight to Tucson, I experimented with editing videos. I took one video of a kid jumping in the pool, cut the most interesting section. It was a bit dark so I lightened it up using the "Adjust" options. Then I changed the speed to 1/4 to make it slow motion.

Viewing & Editing on a Computer

After I am done with viewing and editing 3D video on the device, I download it to my computer, together with the 3D still pictures. To view the video on my computer I use *Stereoscopic Player*. This is a standard program that Jay and others use to project 3D video at our meetings.

Wayne Karberg told me that there are powerful 2D video editors that will work with the XREAL BP video. He recommends *Shotcut* (a freeware). Here is a sample of the things that this will do (according to Wayne): Add/replace sound/music, splice scenes together, provide transitions (such as lap dissolves) between scenes, reverse the direction, insert stills (such as titles). It sounds fantastic! I am looking forward to trying it.

After we are done with 2D editing, we need to fix the stereo window, which is at

infinity. The easiest way to do that would be to crop a certain fixed number of pixels from both sides. Oktay Akdeniz recommends using a program called *HandBrake*. Of course, one can use more complicated 3D video programs like Masuji Suto's *StereoMovie Maker*, *Vegas Pro*, etc.

Bottom Line

The bottom line is that I now have a 3D video camera in my pocket, which is the same camera that I also use to take 3D still pictures. The 3D Video is perfectly aligned and well stabilized. I can do quick editing on the device (useful during long

trips). The effective focal length is very good (wide angle "distortions" are minimized/eliminated). Also, the 50mm stereo base is better than the Sony's 30mm (in most of their 3D video cameras). The format (mp4 with full HD frames side-by-side) is easy to edit with 2D editors, unlike Sony's interlaced format. I see a lot more 3D video in my life now. I only wish I had this earlier, for example, when Theo (our first grandchild) was born, to document his first year in glorious 3D video. But better late than never.

George Themelis



Fig. 3. Examples of 3D pictures extracted from video during our trip to Tucson. *Top:* The models were walking from the building towards a row of photographers. I shot 3D video with the XBM. *Bottom:* During my runs, I saw this bunny and I followed shooting 3D video.

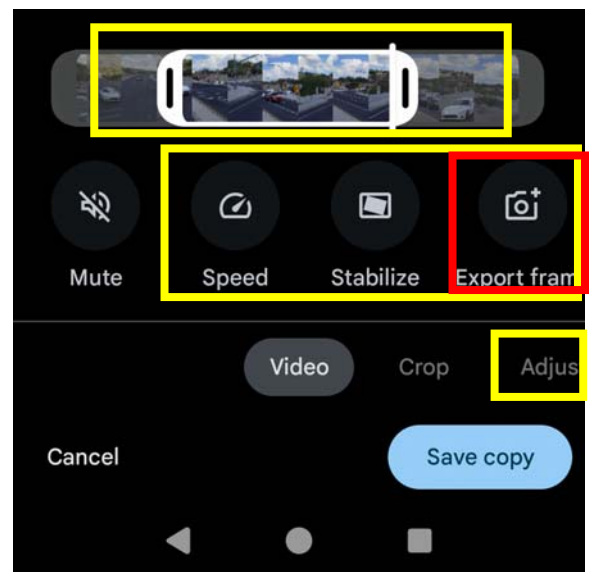
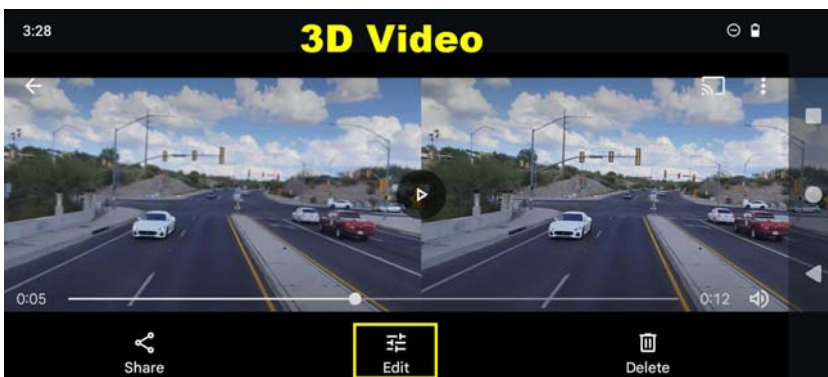


Fig. 2. Screenshot of 3D video (top). The XREAL BP seamlessly integrates 3D still pictures and video. If you click at the Edit button, you get the menu seen on the right. You can then do a number of things, like change the speed or exposure editing (under "Adjust"). One of the most useful features for me is the button labeled "Export Frame." If you pause the video and click this button, the video frame is saved as a still 3D picture.