

# Technical Disclosure Commons

---

Defensive Publications Series

---

May 2021

## Live Viewfinder on Inner and Outer Displays of a Foldable Mobile Device

Karen Vertierra

George Hwang

Follow this and additional works at: [https://www.tdcommons.org/dpubs\\_series](https://www.tdcommons.org/dpubs_series)

---

### Recommended Citation

Vertierra, Karen and Hwang, George, "Live Viewfinder on Inner and Outer Displays of a Foldable Mobile Device", Technical Disclosure Commons, (May 05, 2021)

[https://www.tdcommons.org/dpubs\\_series/4275](https://www.tdcommons.org/dpubs_series/4275)



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

## **Live Viewfinder on Inner and Outer Displays of a Foldable Mobile Device**

### **Abstract:**

This publication describes techniques directed at utilizing a live viewfinder on inner and outer displays of a foldable mobile device. As foldable displays are becoming a more common feature of mobile devices, creative uses of the foldable inner display and the outer display are desirable. If a user uses the inner display as a viewfinder to take a photograph of one or more human subjects, the outer display, facing the subjects, may likewise be utilized as a viewfinder and include providing the subjects with prompts (contextual tips), e.g., to position themselves within the frame. Having viewfinders on the inner and outer displays of the foldable mobile device and providing contextual tips may enrich the communal experience of both user and subject.

### **Keywords:**

Foldable phone, mobile phone, viewfinder, inner display, outer display, back display, cover display, screen, photo, contextual tip, cue, timer, camera

### **Background:**

One of the most noticeable features of a mobile device is its display. Manufacturers are eager to improve the displays, whether that means better resolution, more-vivid colors, or an increased screen-area. However, there are size constraints on the display limited by the form factor of the device.

Manufacturers may overcome the size-constraint problem by developing foldable devices (e.g., foldable phones), as illustrated in Figure 1. Modern foldable devices are generally devices

that have a foldable display as the main display and often include a camera capable of taking photographs. When the display is unfolded, it provides approximately twice the screen area as a device that is not foldable. This foldable display may be referred to as an inner display. The foldable device may also include an outer display. The outer display is on an opposite side of the device from the inner display. In some aspects, the foldable device user may take photographs while viewing the inner display with the outer display facing the subject of the photograph.

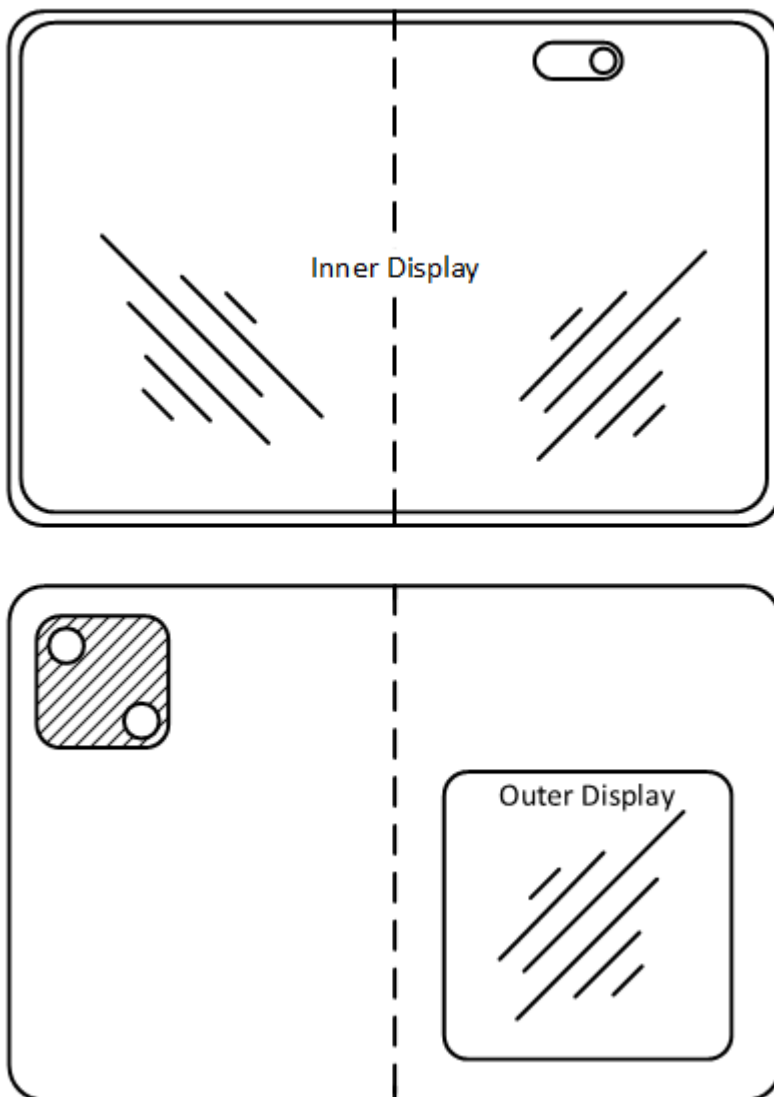


Figure 1

Typically, the outer display of a foldable device is not used during the process of taking a photograph. However, the outer display may be better utilized to provide interesting communal experiences between the user of the foldable device and the subject of the photograph, particularly when the subject is human.

In an example scenario, Tina is on vacation at the beach with some of her friends. She asks someone on the beach to take a photo of her group, but the volunteer starts taking photos without warning and without any instructions on getting everyone within the frame of the photo. When Tina reviews these photos, she notices that some people in the group were partially cropped and others were not looking at the camera. She is disappointed that her photos were not as good as they could have been.

### **Description:**

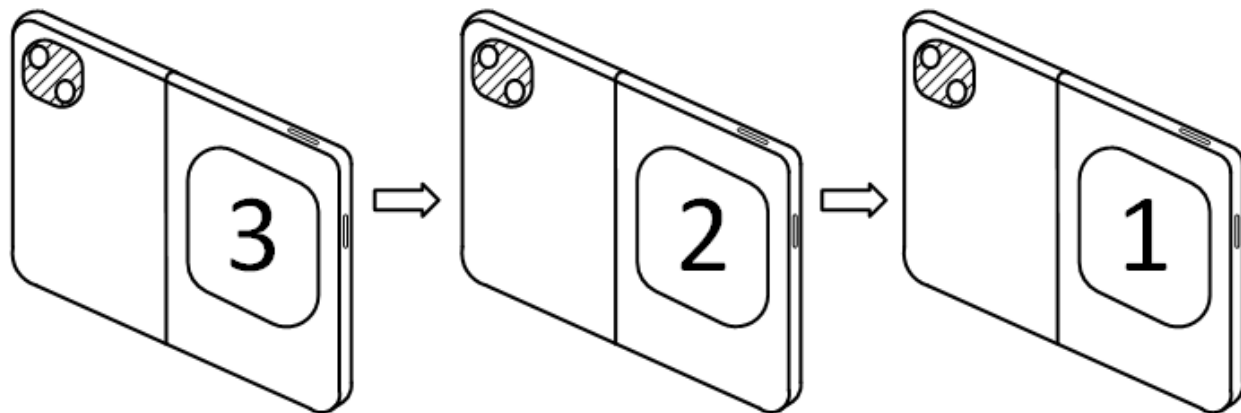
This publication describes techniques directed at utilizing a live viewfinder on inner and outer displays of a foldable mobile device. As foldable displays are becoming a more common feature of mobile devices, creative uses of the foldable inner display and the outer display are desirable. If a user uses the inner display as a user interface and a viewfinder to take a photograph of one or more human subjects, the outer display, facing the subjects, may likewise be utilized as a viewfinder and contextual tips may be provided, e.g., for the subjects to position themselves within the frame, smile, hold still. Having viewfinders on the inner and outer displays of the foldable mobile device may enrich the communal experience of both user and subject.

Foldable mobile devices equipped with foldable displays may include, but are not limited to, smartphones and tablets. These foldable mobile devices include at least one processor having logic for executing instructions, at least one digital camera, an inner foldable display, and an outer

display that may or may not be foldable. The inner foldable display may be a primary display, that is, the display most commonly used by the user when interacting with the device. The outer display may provide images or widgets (e.g., a clock, caller ID) and primarily be used by the user when the device is folded.

The foldable mobile devices also include a computer-readable medium (CRM). The CRM may include any suitable memory or storage device, such as random-access memory (RAM), static RAM (SRAM), dynamic RAM (DRAM), non-volatile RAM (NVRAM), read-only memory (ROM), or Flash memory. The CRM includes a Viewfinder Manager. The Viewfinder Manager may be part of an operating system executing on the computing device. In other aspects, the Viewfinder Manager may be a separate component (e.g., an application) executing within an application environment or “framework” provided by the operating system.

The foldable mobile device performs operations under the direction of the Viewfinder Manager to display the viewfinder of the camera on the inner display and the outer display. In some aspects, the Viewfinder Manager may be configured to direct the foldable mobile device to display the viewfinder to only the inner display or only the outer display. The Viewfinder Manager may also be configured to direct the foldable mobile device to display on the outer display contextual tips that provide the subjects of a photograph with information that may improve the photograph. An example of contextual tips may include suggestions for the subjects to adjust their position (e.g., “move closer,” “move to the right”) in order to be centered in the frame. Another example, illustrated in Figure 2, may be a count-down timer that informs the subject when a photograph will be taken.



**Figure 2**

In another example scenario, Tina and her friends are on a trip to the Grand Canyon. Tina now has a foldable phone that is capable of projecting the viewfinder on the outer screen and providing contextual tips to the subjects of a photo. Another volunteer offers to take a photo of Tina's group. For this photo opportunity, Tina and her friends can see their position within the frame and can adjust their position. Then, when the volunteer presses the shutter button, a countdown begins, notifying Tina and her friends to be ready for the image to be captured. Tina is pleased that her photos on this trip are much better than the photos from the beach.

The described techniques enable a Viewfinder Manager functionality to use the inner display and the outer display of a foldable mobile device to provide a communal experience between the user and the subjects of a photograph. By providing a viewfinder and contextual tips to the subjects of a photograph, the subjects may take a more active role in the image captured and may result in an improved photograph.

### **References:**

[1] Patent Publication: US2020128186A1. Electronic Device having Pivotably Connected Sides with Selectable Displays. Priority Date: February 27, 2014.

[2] Patent Publication: US20200050416A1. Electronic Device having Double-sided Display and Method for Controlling Application. Priority Date: October 5, 2016.

[3] Patent Publication: US20150130738A1. Portable Device and Method for Controlling the Same. Priority Date: May 14, 2012.

[4] Patent Publication: US20120188185A1. Secondary Single Screen Mode Activation Through Off-Screen Gesture Activation. Priority Date: October 1, 2010.

[5] Patent Publication: US20190042066A1. Electronic Device Comprising Multiple Displays and Method for Operating Same. Priority Date: February 5, 2016.