



**PEAKSYSTEMS**

# Layover

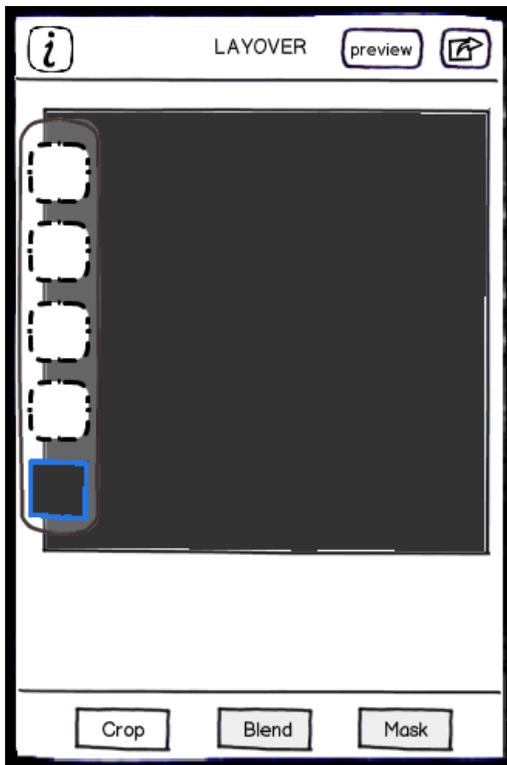
Mobile App Specification  
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## Overview

Layover is an iOS application that allows users to combine photos quickly and easily in unique and creative ways. The app is a layer-based photo blending tool that enables users to create artistic compositions and share with their friends.

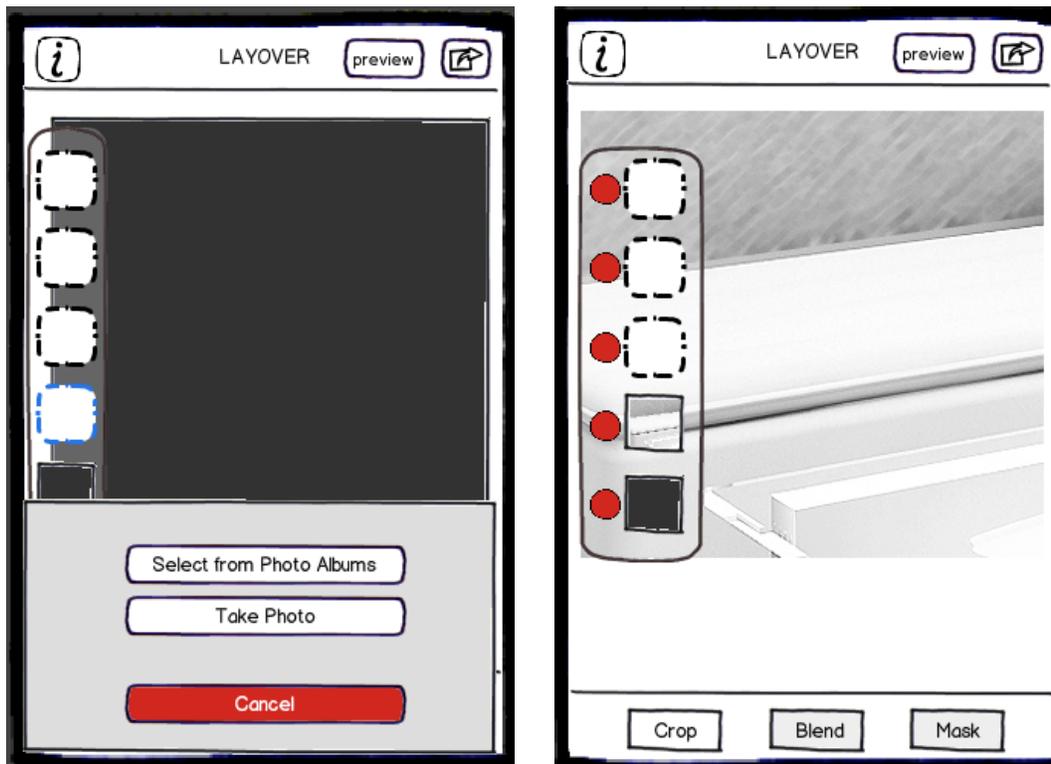
Up to 5 photos can be superimposed using a variety of blending modes and masking. The interface consists of the main image display, a layer palette, and a row of mode buttons that toggle specific editing menus.



## Layers

The layers palette sits on the left side of the display, with 40x40 pt thumbnails of each layer's contents over a translucent background. New layovers have one black background layer by default and all other layers are invisible until the user adds images. Thumbnails are arranged in the palette in the order they are "stacked" to create the composite image.

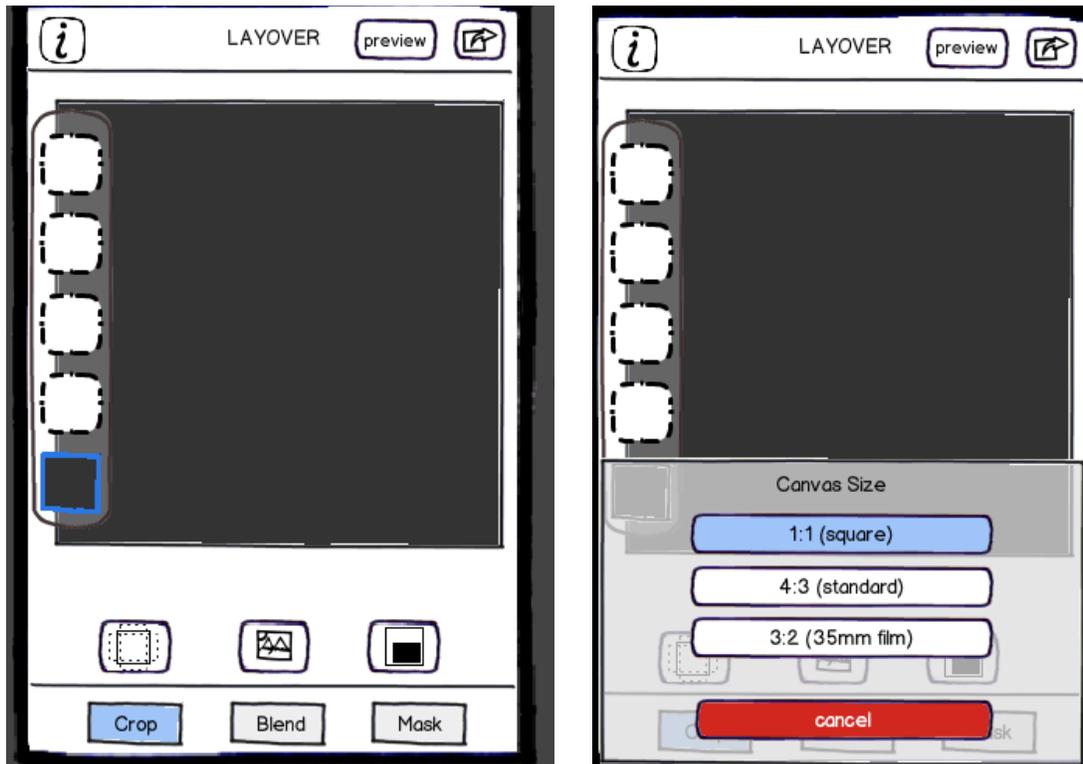
A single tap on an empty thumbnail will select that layer and bring up an action sheet to choose the photo source (photo library or camera), and then a photo picker or camera interface. The photo picker will load the most recent photos by default. A single tap on a layer with an image selects it for editing. Double tap a layer with a photo already in it to bring up the photo source action sheet again. Only one layer can be selected at a time, and a layer is always selected, when the app opens it is the base layer.



Tap and drag a layer thumbnail to move it to a different position in the stack. Tap and hold to expand the palette sidebar and reveal buttons for deleting layers, tap on a button to delete that layer. Deleting a layer will delete the image on that layer and move the empty layer to the top of the stack. Tap anywhere outside the layer palette to hide the delete buttons again. These functions are available as long as the layer palette is visible, regardless of edit mode selection.

## Cropping

In the crop mode, users can control the size and orientation of the canvas, the size of photos on the canvas, and whether or not the canvas edges are "sticky." Tap on a layer to select it for panning with one finger tap and drag, zooming and rotating with the standard pinch-zoom and two-finger rotating gestures. There are three buttons specific to this mode: the canvas size button, portrait/landscape toggle, and sticky edges toggle.



The canvas size button brings up an action sheet of possible canvas aspect ratios: 1:1, 4:3, or 3:2. 1:1 is the default ratio.

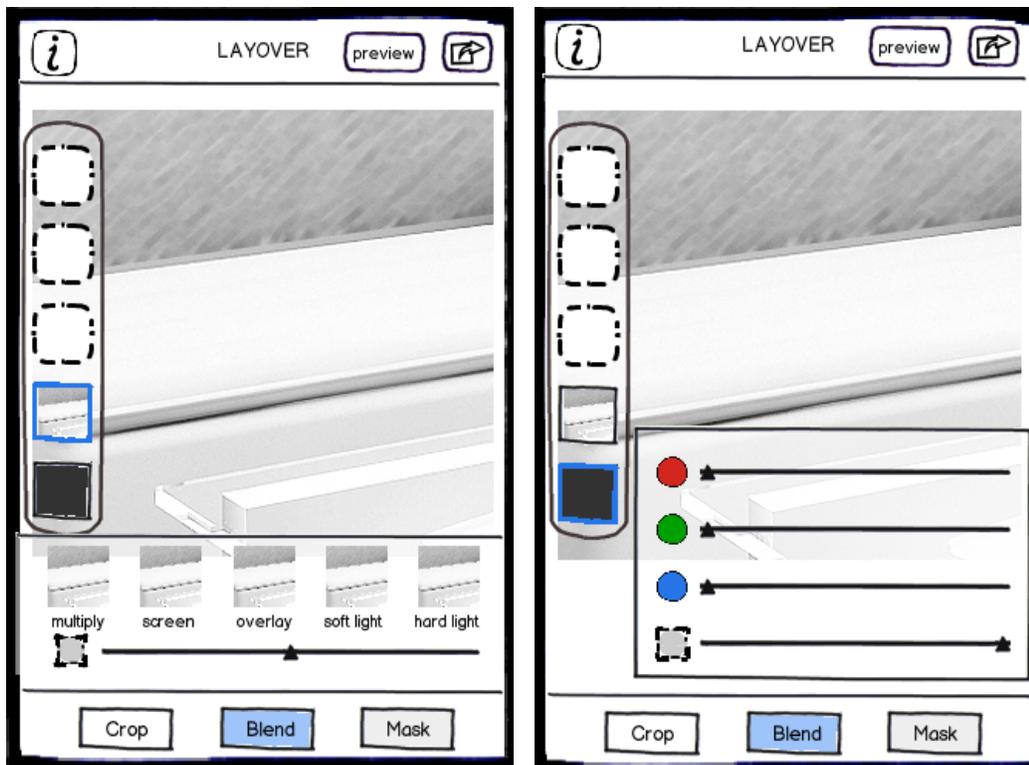
The portrait/landscape button toggles the 4:3 and 3:2 canvas ratios between portrait and landscape orientation. The default orientation is landscape. Tapping this toggle with a 1:1 canvas ratio will not change the 1:1 image at all, but will change which orientation is used if the user changes the canvas to a different aspect ratio. The icon on the button changes to indicate the current orientation selection.

The sticky edges button controls whether it's possible to move or resize a photo so it takes up less than 100% of the canvas area. If sticky edges are on, a photo's borders can't be moved within the canvas borders - each layer is entirely covered by the image it contains. If sticky edges are off, a photo can be moved anywhere in the layer, as long as its smallest dimension is at least 80 points for resized images, and at least 40 pt x 40 pt square is visible on the canvas, for images moved off to one side. At all times enough of the photo should be on the canvas for users to grab and resize or move again if they wish. If a user turns off sticky edges, shrinks or moves a photo so it does not make up the entire layer, and then turns sticky edges back on, the photo will automatically move and/or expand to fill the layer the next time the user tries to resize or move it. The icon on the button changes to indicate the current orientation selection.

## Blending

The app offers a set of common layer blending modes. They are presented as a list of horizontally scrolling thumbnail previews, labeled with the name of the mode. Each thumbnail should show a 40x40 pt preview of the image after the blend is applied to the selected layer, and tapping on a thumbnail applies it to the layer. Users swipe left or right to scroll through the list of possible blend modes. Below the thumbnails is a slider that can be used to adjust the opacity of the currently selected layer. The default blend mode for each new layer is Overlay, and the default opacity is 100%. The bottom layer's opacity is always 100%. If a layer's opacity is set to less than 100% and then the layer is moved to the bottom of the stack, the app remembers the previous opacity value but does not apply it unless the layer moves again.

If the user has not uploaded a photo to the default layer, it has a special blending menu that offers the user sliders to control the RGB and opacity values for that layer. If the user has uploaded a photo to the colored layer, it acts like any other image layer unless the image is deleted.



In all blend mode descriptions, "bottom" layer refers to a composite of all layers below the active layer whose blend mode is being set, which is the "top" layer.

**Dissolve:** use random pixels from both layers, in proportion to the opacity of the top layer. The higher the opacity setting, the more pixels are used from the top layer.

**Multiply:** multiply the pixel values of the bottom layer by the values of the top layer, and divide by 255.

**Screen:** multiply the inverse of the pixel values (255 minus the value) of the bottom layer by the inverse values of the top layer, invert again, then divide by 255.

**Overlay:** a combination of screen and multiply. Multiply the dark parts of the base layer (value < 127.5), screen the light parts of the base layer (value > 127.5).

**Soft Light:** A half-strength combination of screen and multiply

**Hard Light:** Multiply the dark parts of the top layer, screen the light parts of the top layer. Uses the same math as the Overlay mode, but with layer order reversed.

**Color Dodge:** Divide the bottom layer value by the inverted top layer value.

**Color Burn:** Divide the inverse of the bottom layer value by the top layer value, then invert the results.

**Hard Mix:** Apply color dodge to the light parts of the bottom layer, and color burn to the dark values.

**Divide:** divide the bottom layer pixel value by the top layer pixel value

**Add:** add the pixel value of the bottom and top layers, with a maximum of 255.

**Subtract:** subtract the pixel value of the top layer from the bottom layer, with a minimum of 0.

**Difference:** subtract the pixel value of the top layer from the bottom layer, and use the absolute value of the difference.

**Darken:** always use the darker of two pixel values

**Lighten:** always use the lightest of two pixel values.

**Hue:** using HSL/HSV cylindrical color models, the final RGB value combines the luma and chroma of the bottom layer with the hue of the top layer

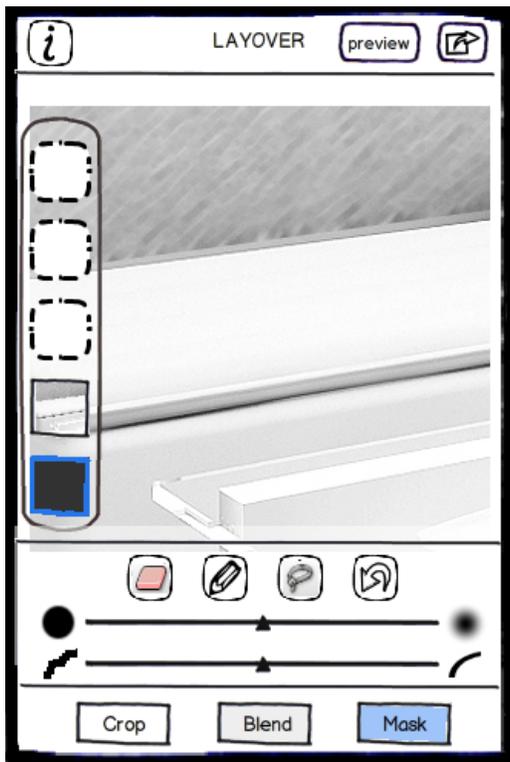
**Saturation:** the final pixel value combines the luma and hue of the of the base layer with the chroma of the top layer

**Color:** uses the luma of the base layer with the hue and chroma of the top layer

**Luminosity:** uses the hue and chroma of the bottom layer with the luma of the top layer

## Masking

Masking lets users erase some parts of a layer while leaving the rest to affect lower layers. Changes to the layer opacity made as part of a mask are proportional to the layer's overall opacity, set in Blend mode. For example, if a layer's overall opacity is 80% in blend mode and some of the layer has been erased to 50% opacity in masking mode, the "erased" parts would have a final effective opacity of 40%, 50% of the total layer opacity. Likewise, parts of the layer that are 100% visible according to the mask, are effectively 80% visible.

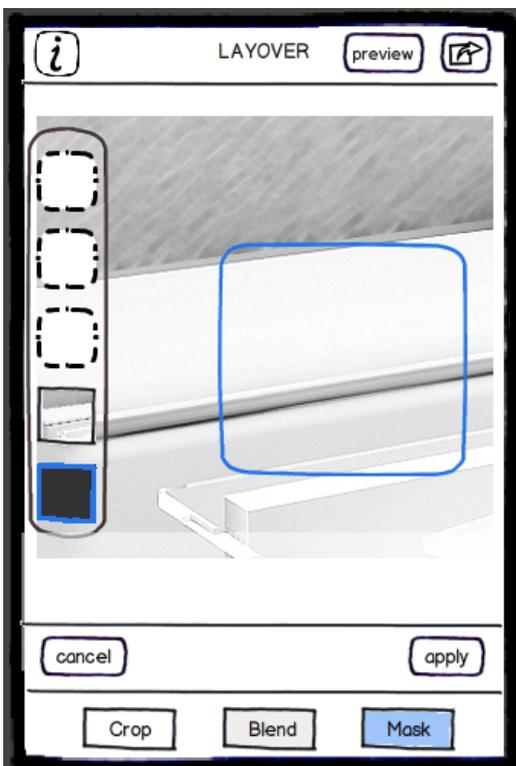


The buttons for masking are: "erase," "draw," "select," and "clear," and beneath these buttons are sliders that control the softness of the brush edges and the degree of path smoothing for erase and draw. Erase and draw allow the user to draw on the image to either erase parts of it or restore visibility to erased portions. Select allows the user to draw around parts of the image and erase everything outside the selection (see the iPad app Mixel for reference). The clear button clears all masking and restores the entire layer to 100% of its blend opacity.

While in masking mode, the user can use the two-finger pinch/zoom gesture to zoom in on a layer for fine control. The onscreen size of the "brush" that users control does not change, but zooming in or out changes how many pixels in the image can be affected by the brush in one touch. Zooming and panning in this mode does not affect the relative size or position of the images in layers, only how they are displayed onscreen.

Drawing and erasing occur along vector paths. The user touches the screen and draws along a path and sees a preview of the path shape as they draw. Then, when the user stops touching the screen, the actual vector path is calculated according to the degree of smoothing selected. When the slider is set all the way to the left, the erasing/drawing occurs exactly along the line that the user draws. When the slider is set all the way to the right, the line the user draws is smoothed and simplified into a single curve after they lift their finger from the screen, and a stroke is applied along the smoothed path. In between, the lines are smoothed and simplified to varying degrees, and a stroke is applied once the user lifts their finger.

The other slider controls the hardness of the brush edges. When the slider is set to the left edge, every pixel the stroke covers is completely filled or erased (opacity set to 0% or 100% of the blend opacity), with minimal anti-aliasing at the edges. When the slider is set to the right edge, only the center 50% of the pixels are filled or erased completely, and the rest fade gradually to the edges of the stroke.



When the user taps the "select" button, the primary masking menu disappears and is replaced by two buttons: "cancel" and "apply." Cancel ends the selection operation without making any changes to the layer mask. When the user draws in this selection mode, a highlighted line shows where the edges of the selection will be. If the user fails to draw a closed shape, the app will close the shape automatically. Drawing on the image again starts a new selection and erases the old one. The user taps "apply" once they have drawn the selection they want, then the masking menu reappears and everything outside the selection is set to have an opacity of 0%. The edges of the selection are anti-aliased, and this anti-aliasing is not adjustable. Drawing and erasing can be applied as normal to the layer once the selection has been cropped.

## Title Bar

Centered in the title bar is the name of the app. On the left side is an info button that offers instructions on how to use the app. On the right, the "preview" button activates preview mode, which shows a full-screen view of the image the user is working on, with only a small "x" button in the top right corner to close the preview and return to the previous editing screen. Next to the preview button is the export button, which exposes a menu of buttons for export options. In version 1, the export options will be: camera roll, email, facebook, flickr, posterous, tumblr, twitter, instagram, and "other apps."

