COSC 4355/6355 – Introduction to Ubiquitous Computing

# Exam - 3

November 17, 2022

## Objective

Develop 'ML Model vs Image Filters' app.

## Motivation

UIFilters, ML, Images processing.

## ***Must Follow***

You must follow the rules below.

1. Start your XCode project "**Exam3_LastName_FirstName**" (replace **LastName** with your last name and **FirstName** with your first name).
a. **DON'T DO** the following:
   i. Start with any other project name and change the zip file name later.
   ii. This will not be accepted at all.

2. You must have to do the exercise compatible with **XCode version 13.4.1** or **XCode version 14**.

## Tips

- **Read the question carefully, then start coding!**
- **Build, Build, and Build**
    - If you add anything on storyboard -> **Build**
    - If you make a reference from storyboard -> **Build**
    - Do not wait until finishing all parts and build.
    - It is easier to debug after each single feature added.

## Submission

Zip XCode project and submit to the blackboard. The name of your zip file will be automatically "**Exam3_LastName_FirstName.zip**" (**LastName** is your last name and **FirstName** is your first name). One submission per person.

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## Details

Create an iOS application using Swift as the programming language. Start your XCode project "**Exam3_LastName_FirstName**" (replace **LastName** with your last name and **FirstName** with your first name).

[2 pts] Design your interface to look like the screenshots [Figure 1 and Figure 5]
• Design your UI for **all iPhone models** in the **Portrait** mode. Disable **Landscape** mode and any screen rotations for all devices.
• Pay attention to images, icons, colors, fonts, and font sizes

Default state: 'Original' tab selected. Buttons '25%' and '75%' are disabled. Image analysis performed. [Figure 1 and Figure 6]
Fonts: Title in American Typewriter, 24; System

[2 pts] When the user taps the first button, allow the user to load images from the photo library [Figure 5]. After a new image is selected, show the new image with no filters applied and the `Original' tab selected. Perform and show the results of ML analysis [Figure 6]. Buttons '25%' and '75%' are not available when the 'Original' tab is selected.

[4 pts] When the user taps one of the filters, apply the relevant image filtering [Figure 7]. The list of filters is:
'Blur' – CIGaussianBlur, radius: 100 (100%)
'Binarize' - CIColorThreshold, threshold: 10 (100%)
'Sepia' - CiSepiaTone, intensity: 0.5 (100%)

Perform and show the results of ML analysis. Buttons '25%' and '75%' are available for each filter. When the user taps one of those, perform **additive** image filtering, like in these examples:
Starting with the initial `Image 0':
Press Sepia tab -> Sepia, intensity 0.5 applied ->`Image 1' complete with ML analysis
Press 25% -> Sepia, intensity 0.5*0.25 applied to `Image 1' -> `Image 2' with ML analysis
Press 75% -> Sepia, intensity 0.5*0.75 applied to `Image 2' -> `Image 3' with ML analysis
…

[2 pts] When the user presses the 'Original' tab, all image transformations are reverted and ML analysis is performed on the initial image, that is, `Image 0' [Figure 1 and Figure 6]

[Bonus points: 2pt.] Replace buttons '25%' and '75%' with a slider [Figure 8]. Range for the slider should be 0 – 300%. Slider filtering is **not additive**. Perform ML analysis after each slider change.

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Good luck and happy coding! ☺ Hope you will enjoy.

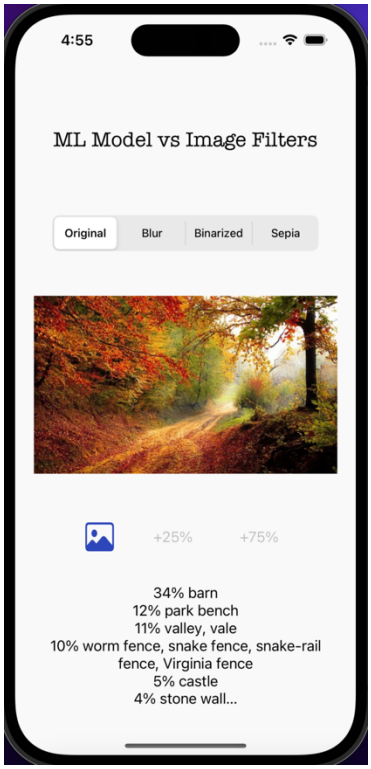


Figure 1

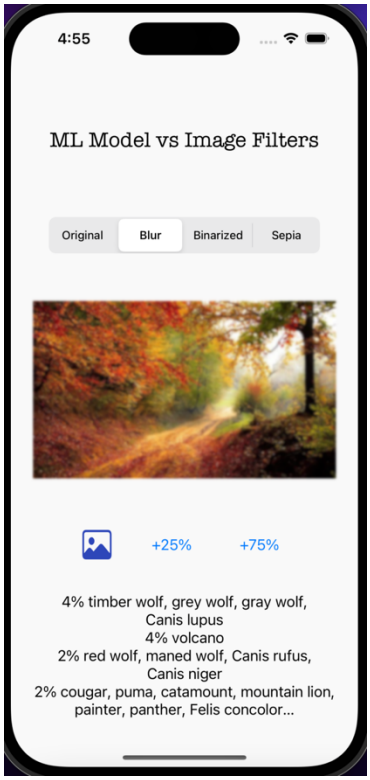


Figure 2

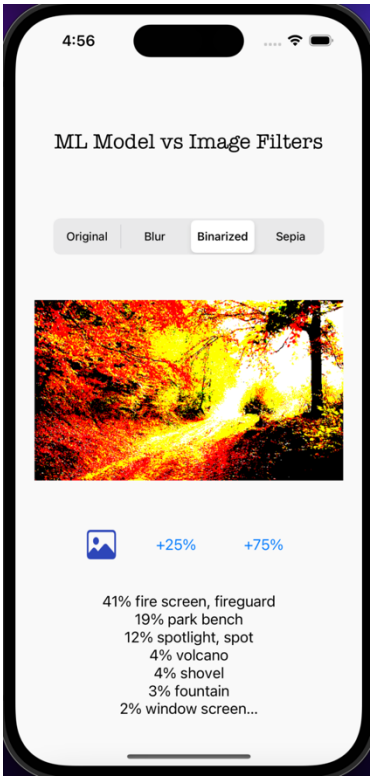


Figure 3

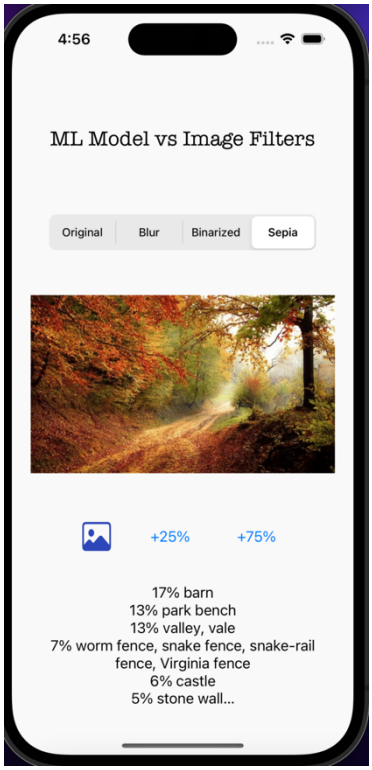


Figure 4

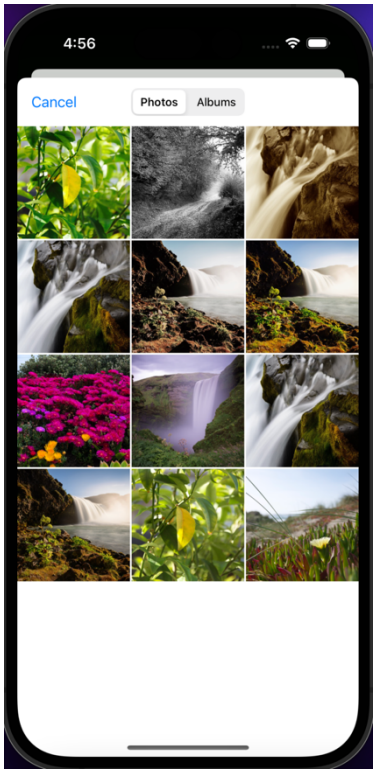


Figure 5

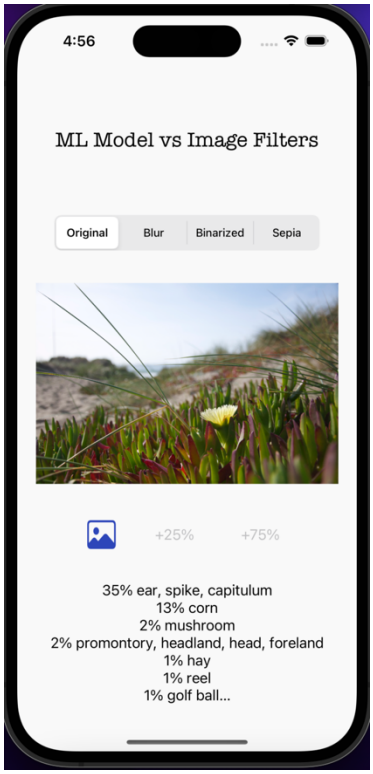


Figure 6

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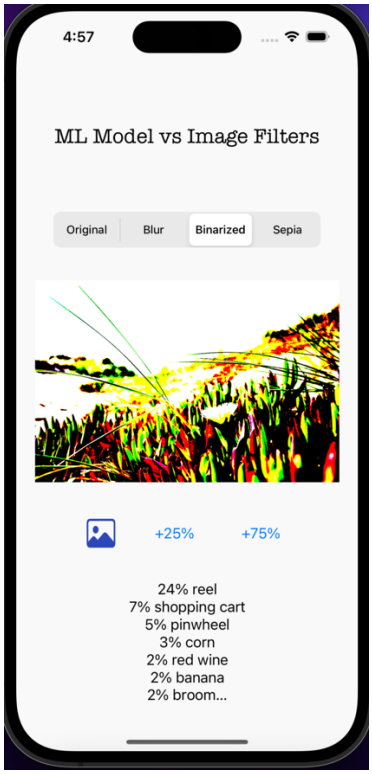


Figure 7

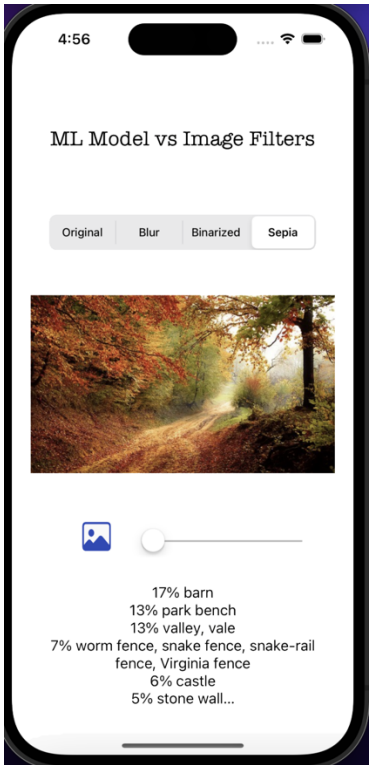


Figure 8