

# Exam - 3

November 16, 2023

## Objective

Develop 'Text recognition vs Image Filters' app.

## Motivation

UIFilters, Text recognition, 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 15.0** or higher.

## 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.

## Details

Create an iOS application using Swift as a programming language. Start your XCode project “Exam3\_LastName\_FirstName” (replace **LastName** with your last name and **FirstName** with your first name).

[6 pts] Design your interface to look like the screenshots [Figures 1 - 9]

- Design your UI for **all iPhone models** in both **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’ segment selected. Buttons ‘25%’ and ‘75%’ are disabled. Image analysis performed. [Figure 1, 6]

Fonts: title – American Typewriter, 24

[4 pts] When user taps the first button, randomly change the image. After new image is selected show the ‘Original’ screen with new image and no filters applied [Fig 1, 6]. Perform text recognition. Buttons ‘25%’ and ‘75%’ are not available when the first ‘Original’ segment is selected.

[3 pts] When user taps one of the filters, apply the appropriate filter to the image.

List of filters:

‘Blur’ – CIGaussianBlur, radius:  $100 * \text{intensity}$

‘Binarize’ - CIColorThreshold, threshold:  $0.5 * \text{intensity}$

With the default intensity set to 0.25

Perform text recognition on the filtered image.

Buttons ‘25%’ and ‘75%’ are available for each filter. When user taps one of those, perform **additive** image filtering.

Example:

Press Blur segment -> Blur, radius  $100 * 0.2$  applied -> updated img updated & analyzed

Press 25% -> Blur, radius  $100 * 0.2$  applied to the updated img -> update & analyze

Press 75% -> Blur, radius  $100 * 0.75$  applied to the updated img -> update & analyze

...

[2 pts] When user press the ‘Original’ segment, all image transformations are reverted. Text recognition performed [Figure 1, 6]

## Bonus

[2pt.] Create iWatch app that depicts three most frequent recognized words [Figure 10].

Update watch content each time image text is recognized.

[1pt.] Replace buttons ‘25%’ and ‘75%’ with the slider. Range for the slider 0 – 300%. Slider filtering is **not additive**. Perform text recognition after each slider change.

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

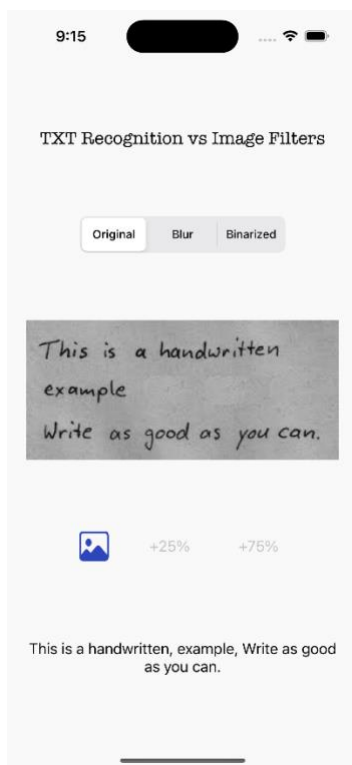


Figure 1

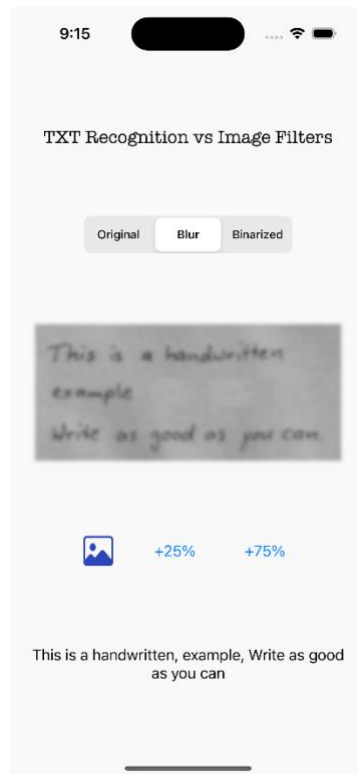


Figure 2

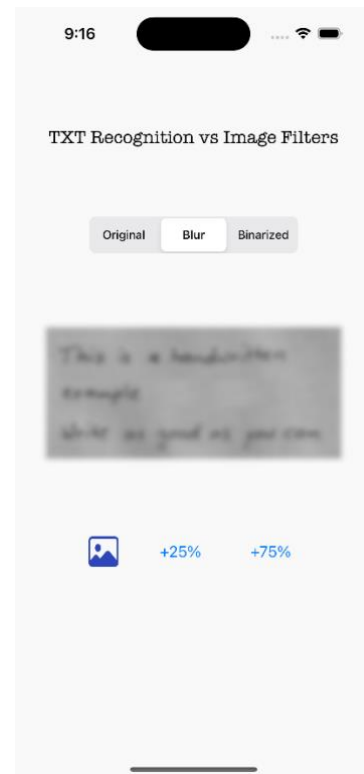


Figure 3

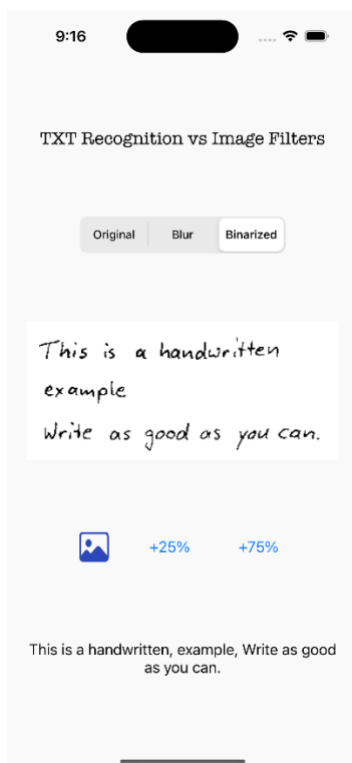


Figure 4

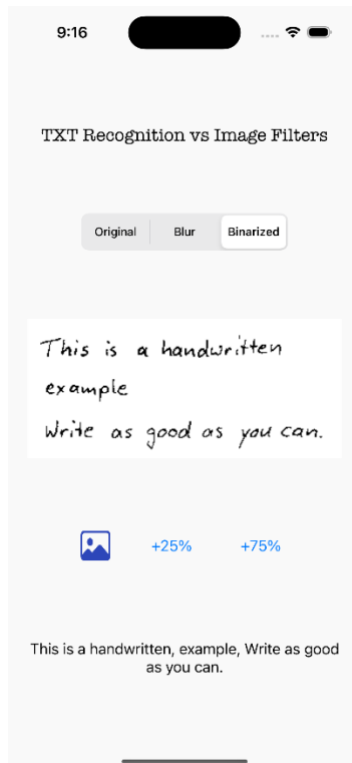


Figure 5

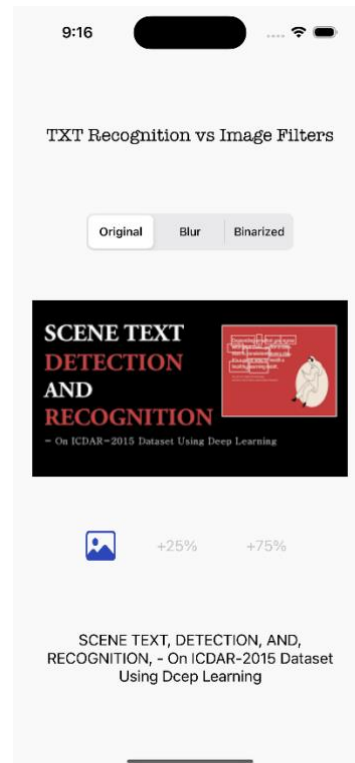


Figure 6

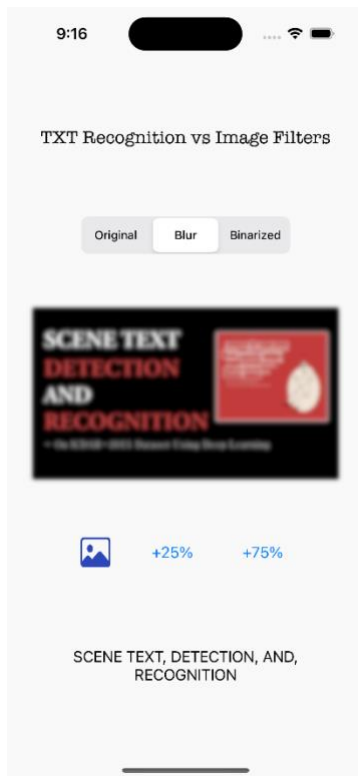


Figure 7

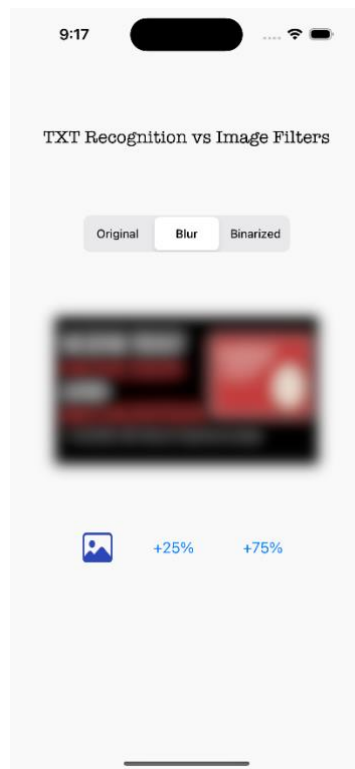


Figure 8

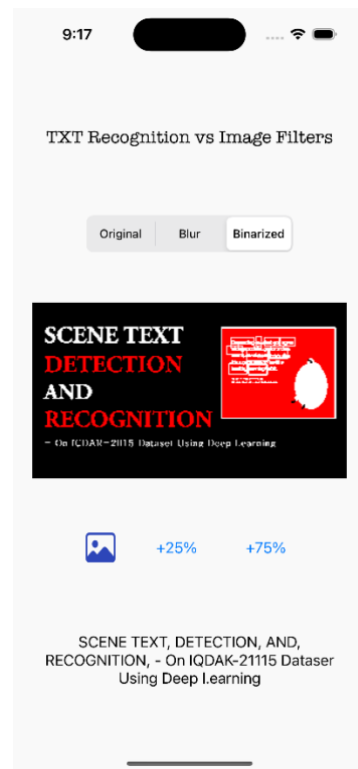


Figure 9



Figure 10