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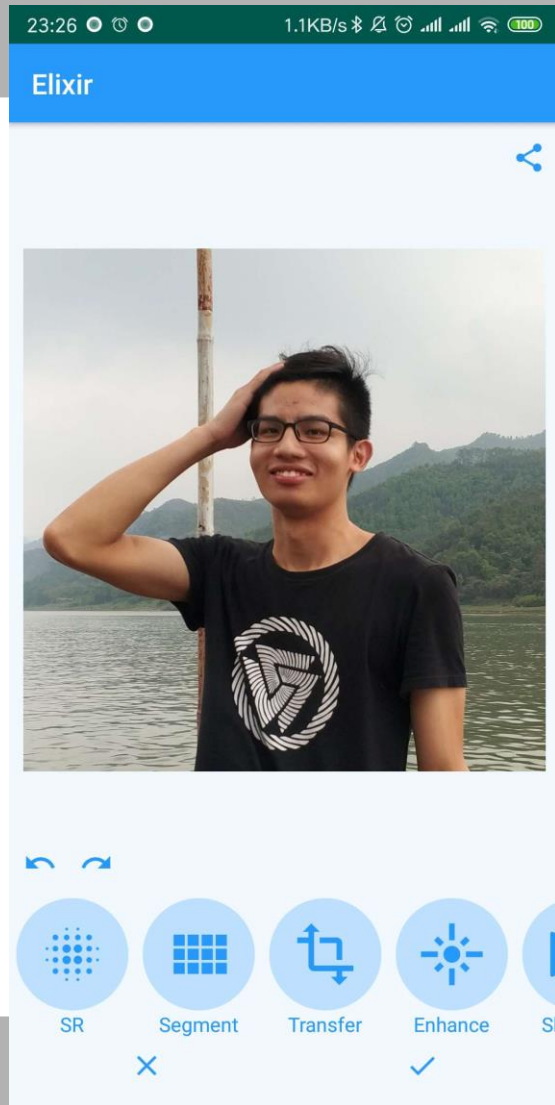
Elixir – Deep Photo

Outline

1. Introduction & Scenarios
2. Timeline
3. Features
4. Testing
5. Conclusions & Future Work
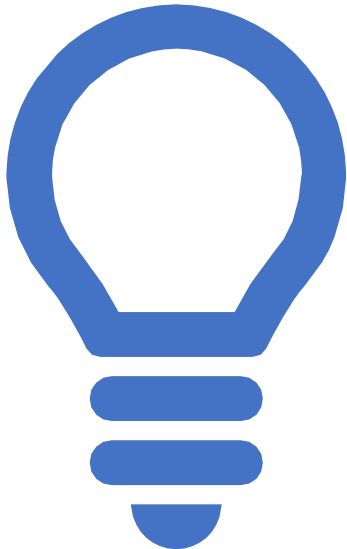
Outline

Introduction

- **DeepPhoto** offers features such as taking photos, adding filters, editing images and uploading them to social networks. Our app features a well designed user interface. A great image can be generated with only just a few touch and taps. We also provide an expert mode for professional users.

Scenarios

- **Background Segmentation**

Soften the background to highlight you.

- **Super Resolution**

Have a better view on low-res photos.

- **Style Transfer**

Share your photos with interesting styles.

- **Photo Enhancement**

Make your photo colorful.

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Timeline & Version Iteration

Week	Task
Week 10	Adjust brightness and contrast, Share to social media
Week 11	Photo Style Transfer (Multiple Styles)
Week 12	Background Segmentation
Week 13	Photo Enhancement
Week 14	Single Image Super Resolution (x2, x4)
Week 15	Reset changes

Timeline & Version Iteration

Commits on Apr 19, 2019

Traditional algorithm: Image sharpening and softening done.
zh-plus committed on 19 Apr
9b76806

save image from camera to file
ZaberKo committed on 19 Apr
476e556

add open camera feature
ZaberKo committed on 19 Apr
9ae48f8

Commits on May 11, 2019

add feature: share image to social media
ZaberKo committed 14 days ago
d212f68

Timeline & Version Iteration

Implement **style** transfer
CRazorback committed 11 days ago
acfab94

add background segmentation model loader and rearrange folder
YijinHuang committed 12 days ago
869d8d0

add background segmentation api
CRazorback committed 12 days ago
32382f7

Add photo enhancement module
YijinHuang committed 20 hours ago
ab69d67

Add **super** resolution package
YijinHuang committed 8 hours ago
c79ab0c

Outline

Photo Style Transfer

Super Resolution

Super Resolution

Background Segmentation

Photo Enhancement

Soften and Sharpen

Outline

Testing techniques

Using a testing framework for Unit Testing

- Junit

Total number of tests: **27**

Testing techniques

- ✓ Usability testing

- Software performance testing

- Output comparison testing

- Smoke testing

Static analysis

CheckStyle

Files	
Name	**Errors**
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/dlutils/Logger.java	75
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/isaac/utils/Filters.java	63
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/bgseg/tflite/DeepLabLite.java	58
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/dlutils/BitmapUtils.java	41
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/bgseg/tflite/DeeplabMobile.java	40
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/Traditional.java	32
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/androidTest/java/com/sustech/elixir/TraditionalTest.java	30
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/styletransfer/tflite/StyleTransferLite.java	29
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/sr/tflite/SuperResolutionLite.java	25
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/styletransfer/tflite/StyleTransferMobile.java	25
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/androidTest/java/com/sustech/elixir/DeepLearningTest.java	22
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/bgseg/loader/SegmentBitmapsLoader.java	20
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/sr/tflite/SuperResolutionMobile.java	18
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/dlutils/AbsAsyncDataLoader.java	18
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/dlutils/ArrayUtils.java	13
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/sr/loader/SuperResolutionBitmapsLoader.java	11
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/styletransfer/loader/StyleTransferBitmapsLoader.java	11
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/isaac/model/DarkChannelPriorDehaze.java	10
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/androidTest/java/com/sustech/elixir/ImageBufferTest.java	9
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/isaac/dehaze/DehazeFunc.java	9
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/bgseg/tflite/DeeplabModel.java	8
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/sr/tflite/SuperResolutionModel.java	8
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/styletransfer/tflite/StyleTransferModel.java	8
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/isaac/dehaze/TransmissionEstimate.java	8
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/dlutils/DeepLearningInterface.java	6
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/dlutils/ImageUtils.java	6
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/isaac/dehaze/AirlightEstimate.java	6
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/traditional/isaac/dehaze/BlkTransEstimate.java	6
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/androidTest/java/com/sustech/elixir/PhotoEnhanceExample.java	5
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/androidTest/java/com/sustech/elixir/CameraTest.java	4
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/deeplearning/styletransfer/tflite/StyleTransferInterface.java	3
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/androidTest/java/com/sustech/elixir/ExampleInstrumentedTest.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/Activities/AddImagePopupWindow.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/Activities/ChooseStylePopupWindow.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/Activities/EditActivity.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/Activities/MainActivity.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/ImageBuffer.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/main/java/com/sustech/elixir/ImageProcessingUtilities.java	0
/Users/Chris/Documents/GitHub/main-project-repository-elixir/app/src/test/java/com/sustech/elixir/ExampleUnitTest.java	0

FindBugs

Summary

Warning Type	**Number**
Bad practice Warnings	11
Total	**11**

Bad practice Warnings

Code	Warning
CN	org.opencv.core.Mat defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Point defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Point3 defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Range defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Rect defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Rect2d defines clone() but doesn't implement Cloneable
CN	org.opencv.core.RotatedRect defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Scalar defines clone() but doesn't implement Cloneable
CN	org.opencv.core.Size defines clone() but doesn't implement Cloneable
CN	org.opencv.core.TermCriteria defines clone() but doesn't implement Cloneable
CN	org.opencv.features2d.DescriptorMatcher defines clone() but doesn't implement Cloneable

These are from the openCV library!

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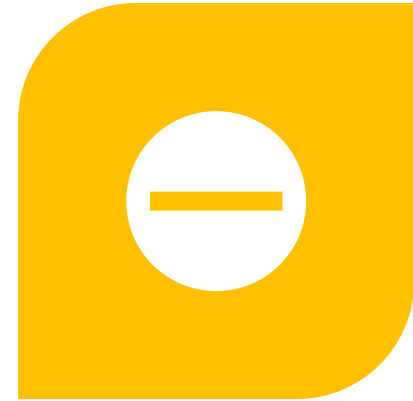5. Conclusions & Future Work

Main ideas & Results

ADVANCED IMAGE PROCESSING TOOLS USING DEEP LEARNING.

LIGHT & USER FRIENDLY.

ALL REQUIREMENTS HAVE BEEN SATISFIED.

Conclusions

Testing is important.

Cost to fix a defect is growing with time.

Balancing on performance & efficiency is hard.

Tensorflow-lite does not support a lot of advanced but common operations.

Q&A