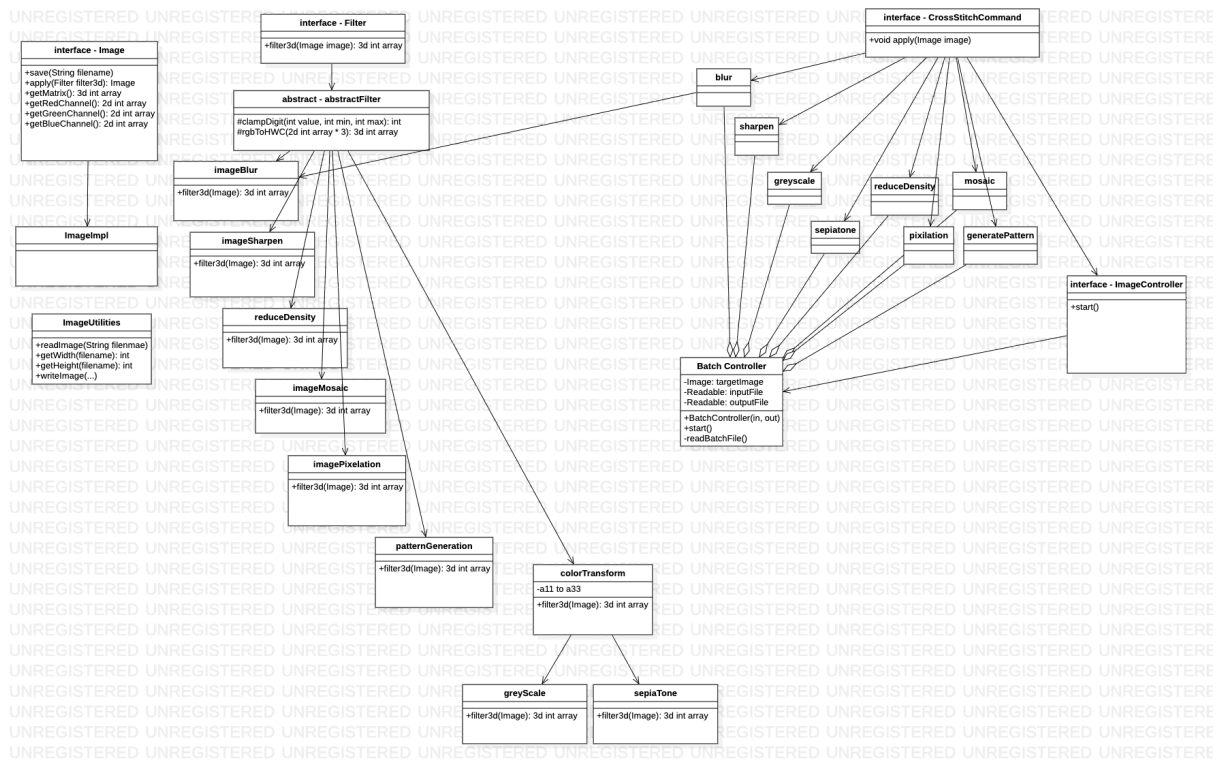# project04 design

☰ Tags	

Primary UML Design

Notes:

- Trying to apply the Command Design Pattern and keeping the double dispatch I used in project 03.

- In this design, the left part (Image and Filters) will be the "Model", and the Commands and the BatchController will be the "Controller".

- I'm treating the mosaic, pixilation, and pattern generation as two additional filters. The Pixilation and pattern generation might overlap a lot. I will see how much they overlap during implementation to see whether to abstract these two classes.

- I'm pretty sure I can further abstract these filters to make them into two or three big categories (i.e. abstract colorTransform, abstract kernelFilter, and maybe another abstract class.) I will wait until the actual implementation to see how to make this happen.

Something I'm not so sure about...

- Not super sure what's the correct relationship between a command and the specific imageFilter class to achieve that command...so I just drew one between Blur command and Blur Filtering class.

- Not so sure about the `Batch Controller` class as it serves more like the driver in previous case with a `main` or `start` static method.

interface - Image

+save(String filename)
+apply(Filter filter3d): Image
+getMatrix(): 3d int array
+getRedChannel(): 2d int array
+getGreenChannel(): 2d int array
+getBlueChannel(): 2d int array

ImageImpl

ImageUtilities

+readImage(String filenmae)
+getWidth(filename): int
+getHeight(filename): int
+writeImage(...)

interface - Filter

+filter3d(Image image): 3d int array

abstract - abstractFilter

#clampDigit(int value, int min, int max): int
#rgbToHWC(2d int array * 3): 3d int array

imageBlur

+filter3d(Image): 3d int array

imageSharpen

+filter3d(Image): 3d int array

reduceDensity

+filter3d(Image): 3d int array

imageMosaic

+filter3d(Image): 3d int array

imagePixelation

+filter3d(Image): 3d int array

patternGeneration

+filter3d(Image): 3d int array

colorTransform

-a11 to a33

+filter3d(Image): 3d int array

greyScale

+filter3d(Image): 3d int array

sepiaTone

+filter3d(Image): 3d int array

interface - CrossStitchCommand

+void apply(Image image)

blur

sharpen

greyscale

reduceDensity

mosaic

sepiatone

pixilation

generatePattern

interface - ImageController

+start()

Batch Controller

-Image: targetImage
-Readable: inputFile
-Readable: outputFile

+BatchController(in, out)
+start()
-readBatchFile()

Testing plans

The duty of a controller in this project is to take in a txt file containing one or multiple commands,

Test Controller

Aa Name	☰ Input	☰ Expected
test with invalid batch input	give a none readable input file	IOException
test with batch input with readable input file that contains invalid command format	give a readable input file with wrong command format	IllegalArgumentException
test with a batch input using none existing image	give a readable input file with none existing image address	IOException
test with a batch input using none existing saving path	give a readable input file with none existing saving address	IOException

Test Controller Commands

Aa Name	≡ Expceted
test controller call blur command correctly	Eyeball check image result
test controller call sharpen command correctly	Eyeball check image result
test controller call mosaic command correctly	Eyeball check image result
test controller call pixilation command correctly	Eyeball check image result
test controller call patten generation command correctly	Eyeball check image result