Fauxtoshop YEAH Hours

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A few quick notes

- Get started quickly! QTCreator can sometimes cause issues and we will not be able to help you at 1:00AM the night before if your QTCreator does not work! I suggest getting started TODAY!
- Check out the Style guide before you start. Poor style equals poor grades!
- This is an individual assignment. Make sure you fully read through and understand the Honor Code for this course!

Helpful Resources

- Lecture 1 & 2 Basic Introduction to C++
- Lecture 3 ADTs (more specifically The Grid)
- CS106B+X Style Guide (**very important** for students not from CS106A)
- Stanford C++ Documentation
- Cynthia’s Piazza Post Videa

The C++ Grid

Helpful functions:

- `inBounds(row, col)`
- `grid[row][col]`
- `set(row, col, value)`
- `get(row, col)`
- `numRows()`
- `numCols()`

Have you seen this slide? You should check it out!

Handy loop idiom: iterating over "neighbors" in a Grid

```
static void neighbors(Grid<bool>& board, int row, int col) {
    for (int drow  = -1; drow  <= 1; drow++) {
        for (int dcol = -1; dcol <= 1; dcol++) {
            // do something with board[row + drow][col + dcol]
        }
    }
}
```

R -1 C -1	R -1 C +0	R -1 C +1
R +0 C -1	R +0 C +0	R +0 C +1
R +1 C -1	R +1 C +0	R +1 C +1

These nested for loops generate all the pairs in the cross product {-1,0,1} x {-1,0,1}, and we can add these as offsets to a (row,col) coordinate to generate all the neighbors (note: often want to test for and exclude the (0,0) offset, which is "self" not a neighbor)

Helpful video on Piazza!

note

88 views

Actions

Fauxtoshop tips: code from class

Hi everyone, we didn't finish the code example in class, but I want you to have it before Monday. So I posted the finished version to the lectures page. I'll also make a youtube video talking through the rest of the example (sort of an add-on video for the lecture video) when I get back to my computer later tonight. Hope that helps!

Here's the direct link to the example code: http://web.stanford.edu/class/cs106b/materials/FauxtoshopFlipVerticalExample.zip

UPDATE: and here's the video completing the example: https://www.youtube.com/watch?v=q-QaPx4-WjQ

#pin

hw1

edit · good note | 0

Updated 2 days ago by Cynthia Bailey Lee

The key to success: Decomposition!

- This assignment is all about learning to approach problems in an organized and thoughtful way.
- Decomposition will be your best friend!
- In addition, decomposition is one of the main components to you style grade!

DO NOT CROSS STREAMS!

- If you use cin, do NOT use getLine or getInteger
- If you use getLine or getInteger do NOT use cin

If you do not follow this rule, you WILL have bizarre horrible bugs):

The Starter Code

```
/* STARTER CODE FUNCTION - DO NOT EDIT
 *
 * This main simply declares a GWindow and a GBufferedImage for use
 * throughout the program. By asking you not to edit this function,
 * we are enforcing that the GWindow have a lifespan that spans the
 * entire duration of execution (trying to have more than one GWindow,
 * and/or GWindow(s) that go in and out of scope, can cause program
 * crashes).
 */
int main() {
    GWindow gw;
    gw.setTitle("Fauxtoshop");
    gw.setVisible(true);
    GBufferedImage img;
    doFauxtoshop(gw, img);
    return 0;
}

/* This is yours to edit. Depending on how you approach your problem
 * decomposition, you will want to rewrite some of these lines, move
 * them inside loops, or move them inside helper functions, etc.
 *
 * TODO: rewrite this comment.
 */
static void doFauxtoshop(GWindow &gw, GBufferedImage &img) {
    cout << "Welcome to Fauxtoshop!" << endl;
```

The GWindow

- You should never be trying to create multiple GWindows! The gw, which is created in the main() function, should live for the entire span of the program. If you do not follow this guideline you may have some very odd bugs.

Helpful functions

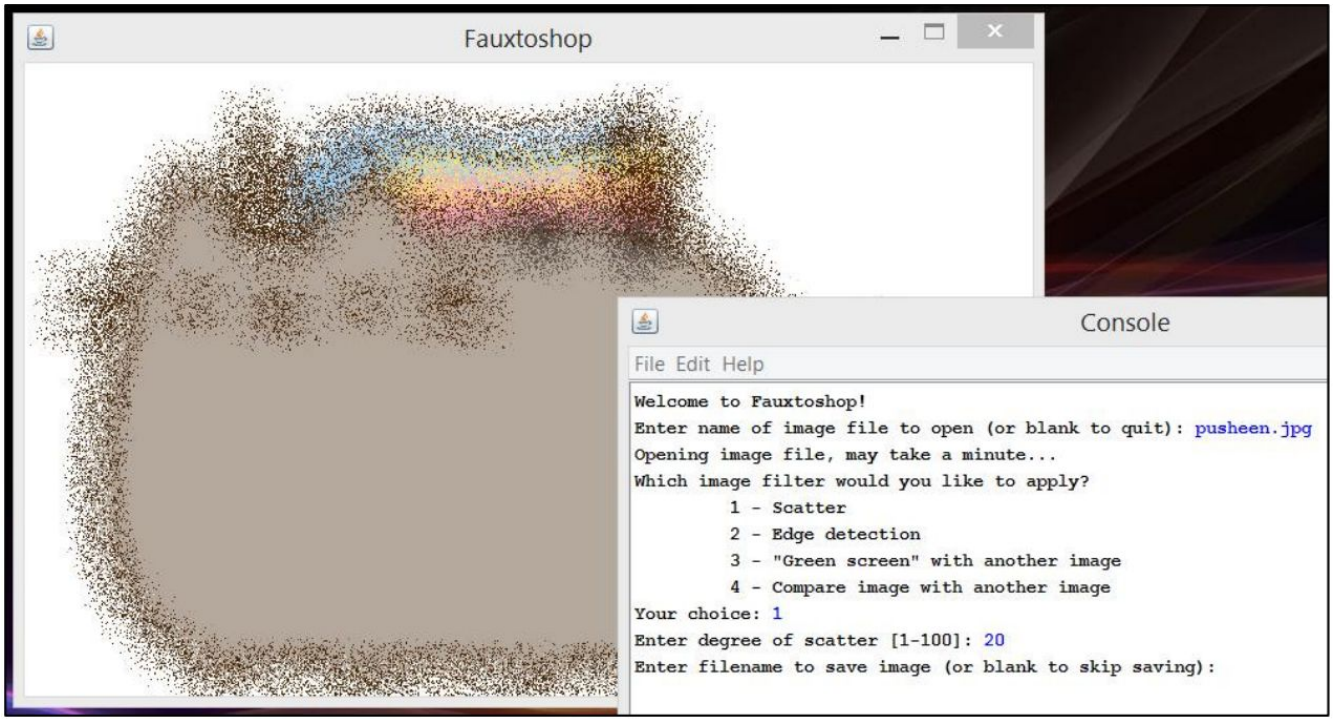
We've given you several helpful functions to make the assignment more manageable. Make sure you go through these before you start coding this assignment up!

- openImageFromFilename
- saveImageToFilename
- getMouseClickLocation

Some helpful snippets!

```
Grid original = img.toGrid();

gw.setCanvasSize(img.getWidth(), img.getHeight());

gw.add(&img,0,0);

int pixel = original[row][col];

int red, green, blue;

GBufferedImage::getRedGreenBlue(pixel, red, green, blue);
```

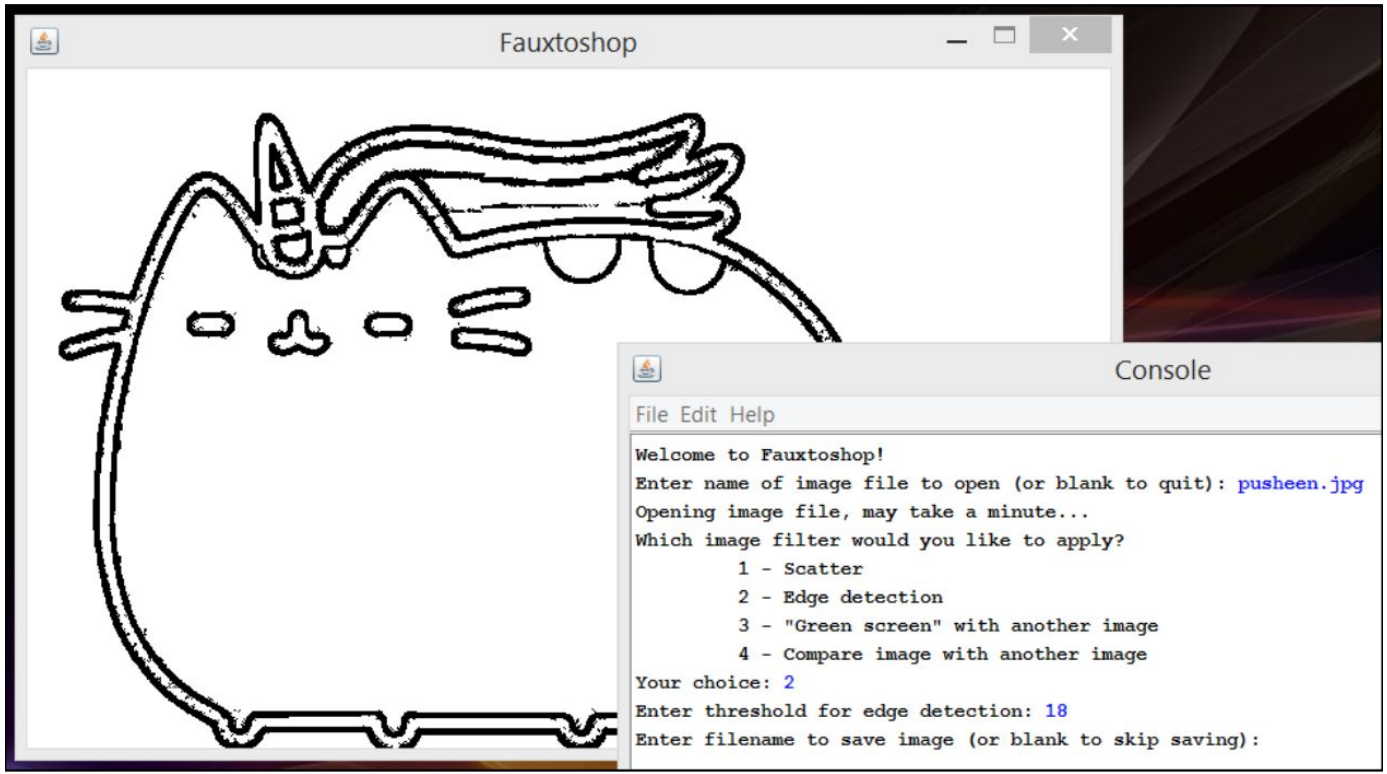
Scatter


Fauxtoshop
Console
File Edit Help
Welcome to Fauxtoshop!
Enter name of image file to open (or blank to quit): pusheen.jpg
Opening image file, may take a minute...
Which image filter would you like to apply?
1 - Scatter
2 - Edge detection
3 - "Green screen" with another image
4 - Compare image with another image
Your choice: 1
Enter degree of scatter [1-100]: 20
Enter filename to save image (or blank to skip saving):

Scatter

- First, prompt for the radius (between 1 and 100)
- Next, create a new grid with the same dimensions
- Populate each value in the grid by choosing a pixel from the old image. You will choose these pixels by randomly selecting a pixel that is within the radius. If the pixel is out of bounds, try again until you get a pixel which is in bounds.

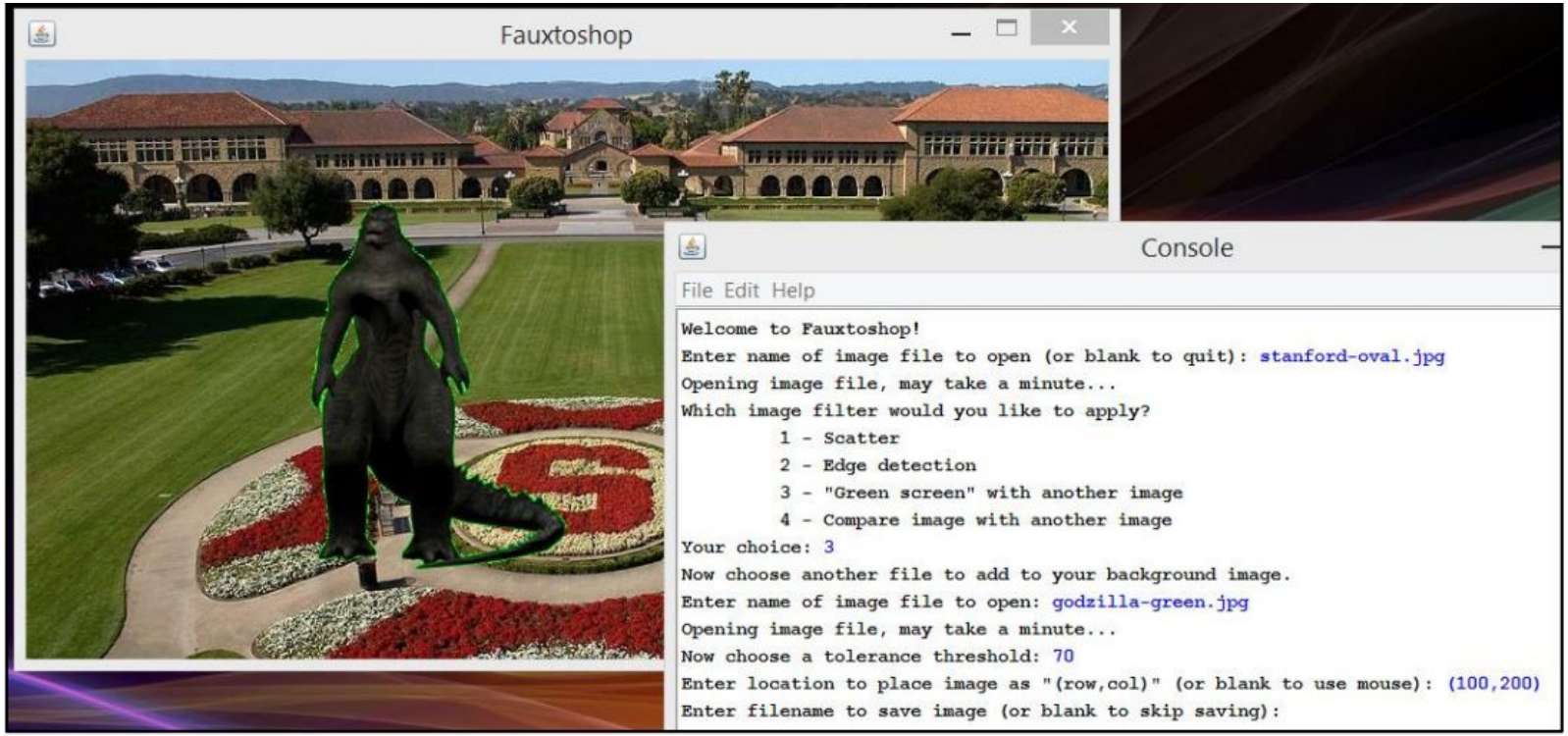
Edge Detection



Edge Detection

- First, prompt for a threshold
- Determine if a pixel is an “edge”. It is an edge if at least one of its neighbors has a difference of greater than threshold from it.
- Color all edges black with all other pixels white

Green Screen



Green Screen

- For those of you from CS106A, this is a different way of doing green screen than we did in ImageShop, so don’t try to do it that way!
- Our version takes a “sticker” image and pastes it on the “background” image.

Compare Images

Console

File Edit Help

```
Welcome to Fauxtoshop!
Enter name of image file to open (or blank to quit): kitten.jpg
Opening image file, may take a minute...
Which image filter would you like to apply?
        1 - Scatter
        2 - Edge detection
        3 - "Green screen" with another image
        4 - Compare image with another image
Your choice: 4
Now choose another image file to compare to.
Enter name of image file to open: godzilla-green.jpg
Opening image file, may take a minute...
These images differ in 786432 pixel locations!
Enter filename to save image (or blank to skip saving):
```

Good Luck!