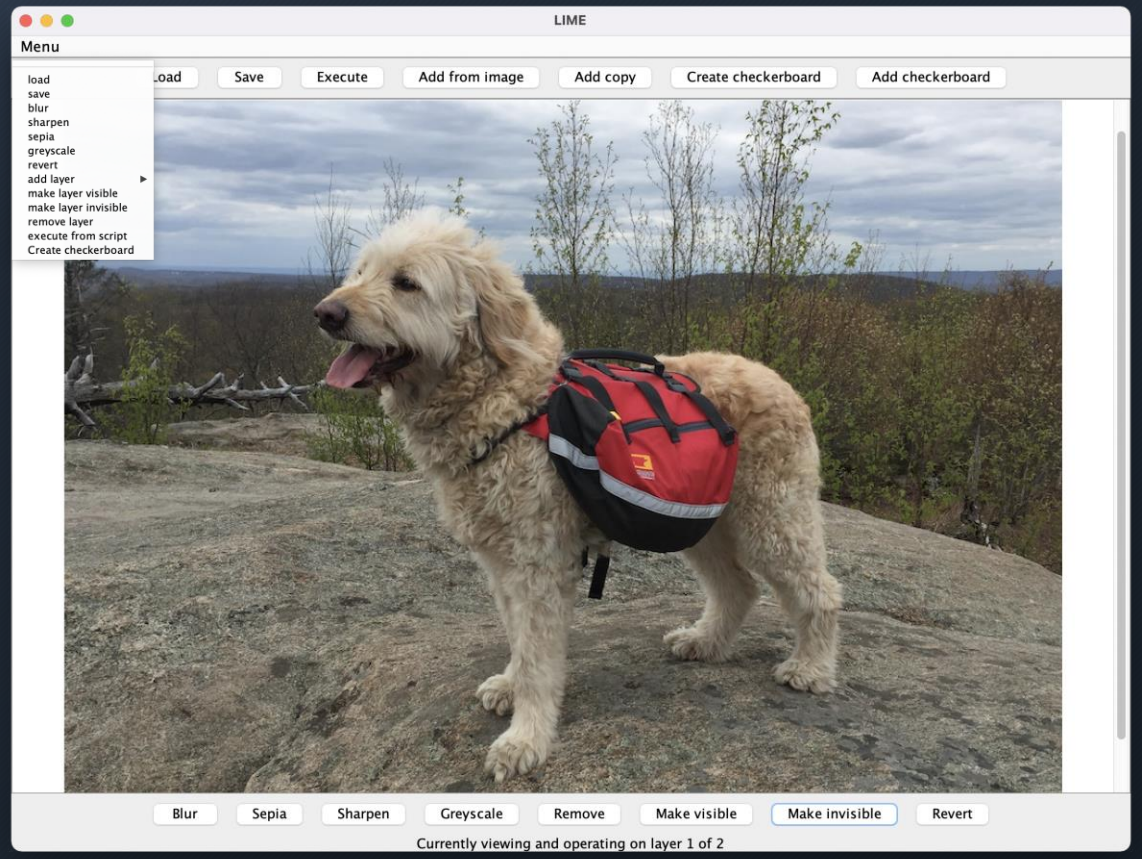
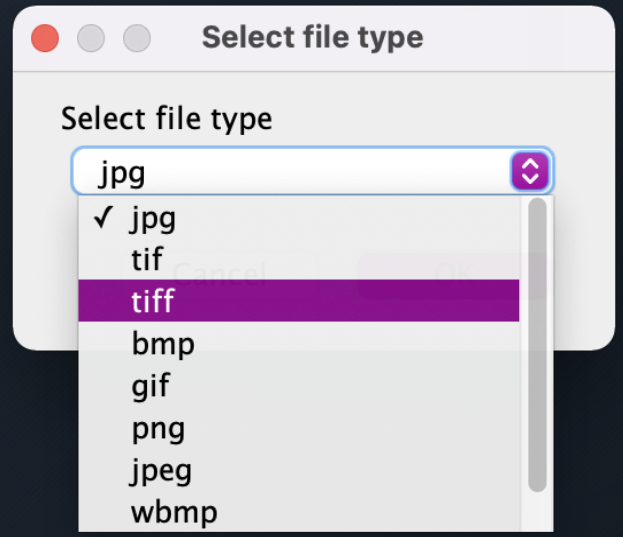
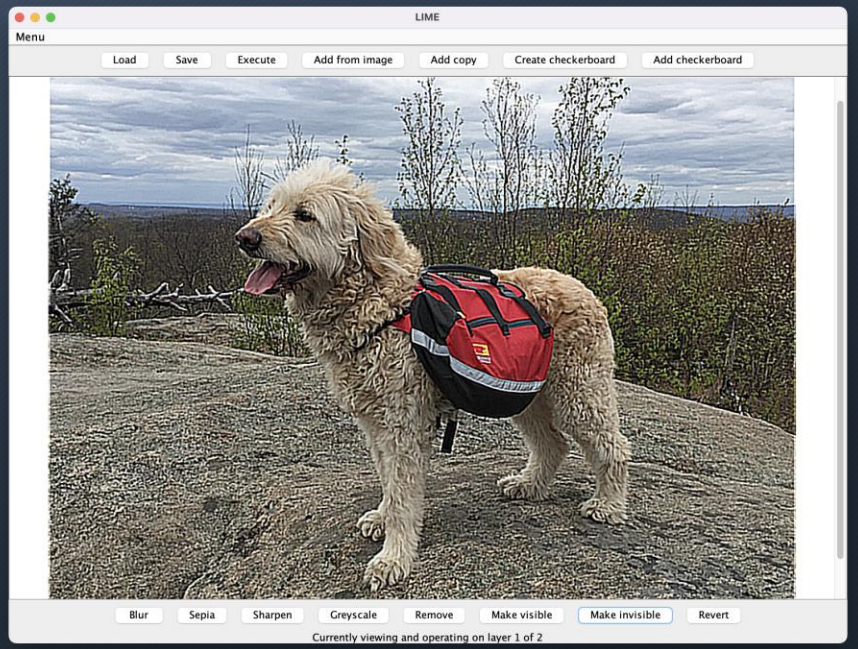
Layered Image Manipulator & Enhancer

Zachary Rippas

Project Overview



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Sharpen
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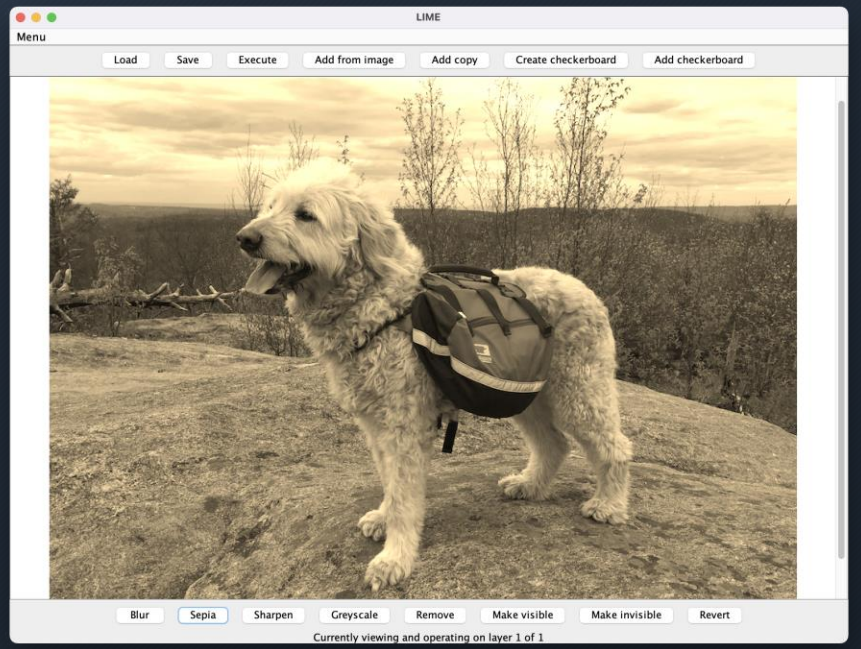
Currently viewing and operating on layer 1 of 2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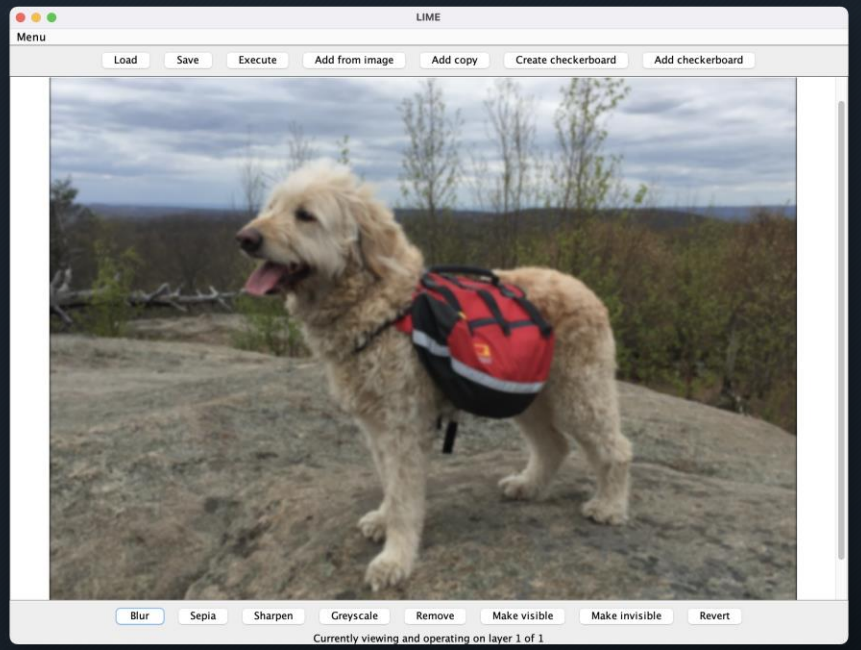
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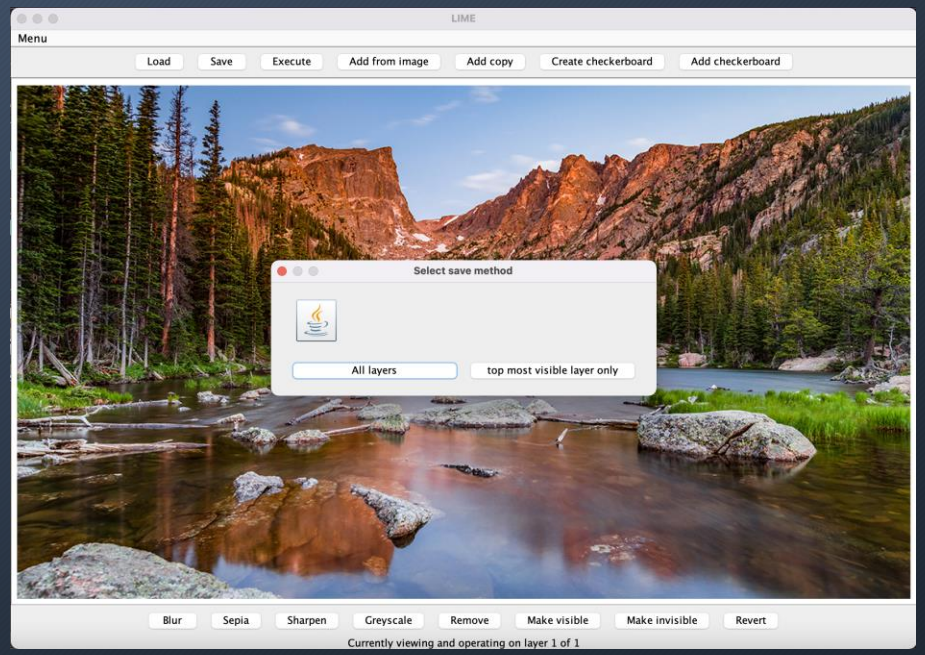
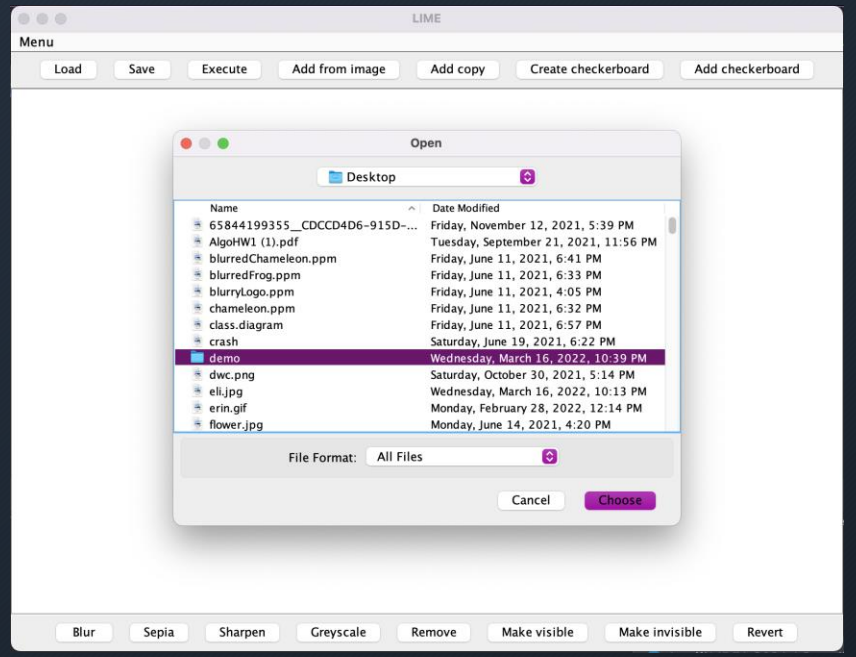
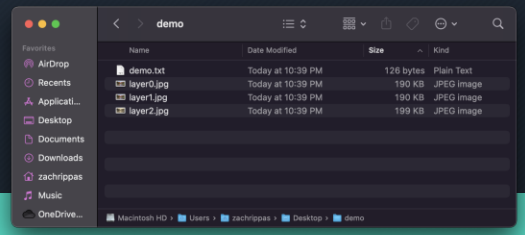






Download/Upload Functionality

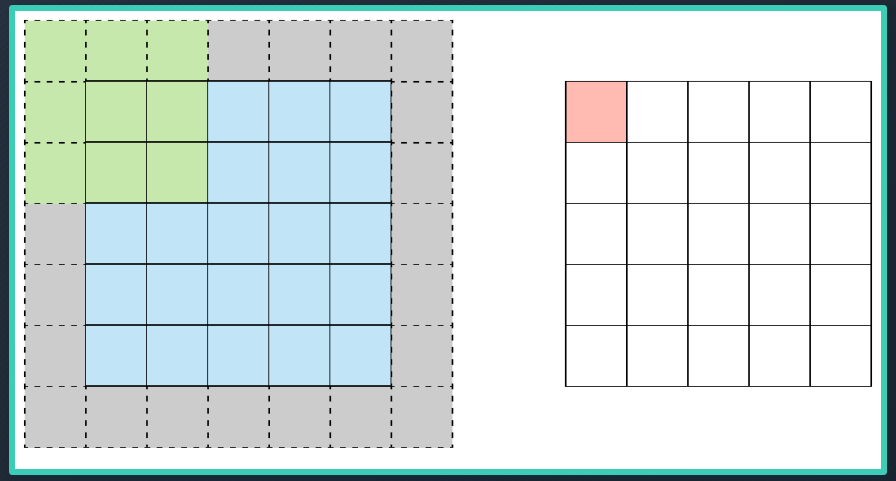
Design Overview

- Strong emphasis on OO principles → Encapsulation, Abstraction, Inheritance, and Polymorphism
- Followed MVC design strategy
- Implemented Command Design Pattern and Factory Pattern
- Designed with future extensibility in mind

Model View Controller

Algorithms Used

Filtering: $O(nm)$



$$\begin{bmatrix} r' \\ g' \\ b' \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} * \begin{bmatrix} r \\ g \\ b \end{bmatrix}$$

Color Transformation: $O(n)$

Code Samples

```java
@Override
public void greyscale() {
  versions.push(new Greyscale().apply(versions.peek()));
}
```

```java
@Override
public void revert() throws IllegalStateException {
  if (versions.size() == 1) {
    throw new IllegalStateException("Nothing to revert to");
  }
  versions.pop();
}
```

```java
Pixel[][] pixels = new Pixel[image.getHeight()][image.getWidth()];

for (int i = 0; i < image.getHeight(); i++) {
  for (int j = 0; j < image.getWidth(); j++) {
    int pixel = image.getRGB(j, i);
    Color color = new Color(pixel);
    int red = color.getRed();
    int green = color.getGreen();
    int blue = color.getBlue();

    pixels[i][j] = new Pixel(new ClampedColor(red, green, blue));
  }
}
```

```java
@Override
public File chooseFile() {
  final JFileChooser fchooser = new JFileChooser( currentDirectoryPath: ".");
  fchooser.setFileSelectionMode(JFileChooser.FILES_AND_DIRECTORIES);
  int retvalue = fchooser.showOpenDialog( parent: GraphicalView.this);
  if (retvalue == JFileChooser.APPROVE_OPTION) {
    return fchooser.getSelectedFile();
  }
  return null;
}
```

```java
@Override
public void export(String fileName) {
  File outFile = new File(fileName);
  try {
    outFile.createNewFile();
    String format = FileUtil.getFileExtension(fileName);
    FileUtil.checkNotSupported(format);
    ImageIO.write(makeBufferedImage(), format, outFile);
  } catch (IOException e) {
    throw new IllegalArgumentException("Writing to the given file failed: " + e.getMessage());
  }
}
```

```java
@Test
public void testConstructorClamps() {
  c = new ClampedColor( red: -100,  green: 50,  blue: 300);
  assertEquals( expected: 0, c.getRed());
  assertEquals( expected: 50, c.getGreen());
  assertEquals( expected: 255, c.getBlue());
}
```

```java
@Test
public void testCreateWidthHeight() {
  assertEquals( expected: 1024, new ImageFromPPM().create("Koala.ppm").getWidth());
  assertEquals( expected: 768, new ImageFromPPM().create("Koala.ppm").getHeight());
}
```

```java
for (int i = 0; i < expected.length; i ++) {
  for (int j = 0; j < expected[0].length; j ++) {
    assertEquals(expectedImage.getPixelAt(i,j).getColor().getRed(),
        blurred.getPixelAt(i, j).getColor().getRed());
    assertEquals(expectedImage.getPixelAt(i,j).getColor().getGreen(),
        blurred.getPixelAt(i, j).getColor().getGreen());
    assertEquals(expectedImage.getPixelAt(i,j).getColor().getBlue(),
        blurred.getPixelAt(i, j).getColor().getBlue());

  }
}
```

```java
@Test(expected = IllegalArgumentException.class)
public void testNullImage() {
  ImageOperation blur = new ImageBlurrer();
  blur.apply( image: null);
}
```

```java
@Test
public void testSaveWiring() {
  this.mockView.fireSaveEvent();
  assertEquals( expected: "save initiated", this.vout.toString());
  assertEquals( expected: "save handled", this.cout.toString());
}
```

Quality Assurance

github.com/zatchet/LIME