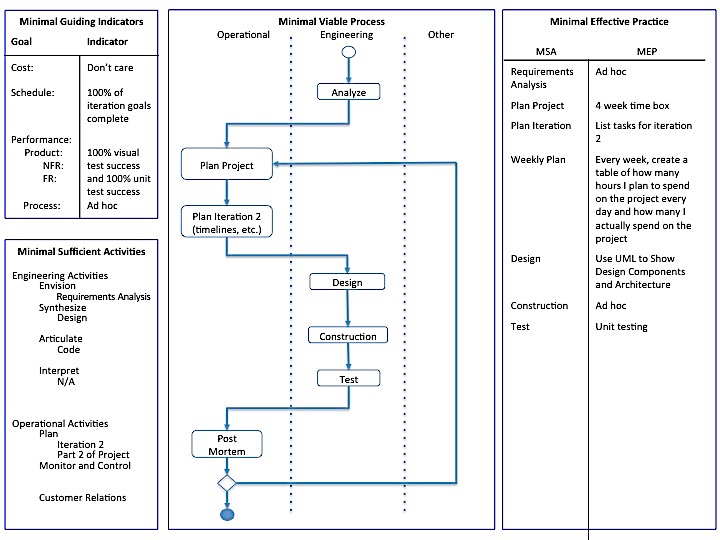
Iteration 6

# Process for Iteration 6



The process has not changed since Iteration 4.

# Requirements Analysis

The requirements have not changed since Iteration 1. They are as follows:

Given a secret image file and two innocent image files, the tool should

* Be able to read in image files and store the pixel information
* Use the extended visual cryptography scheme to encode the secret image pixels into the two innocent images
* Store the encoded images in new image files
  + The filenames and location can be specified by the user. If not, the files are named share1 and share2 and gets stored on the Desktop.

Given two encoded image files, the tool should

* Be able to read in the files and store the pixel information
* Use the extended visual cryptography scheme to decode the secret image from the encoded images (similar to super imposing them)
* The image revealing the secret gets stored in a new image file
  + The filename and location can be specified by the user. If not, the file is named secretMsg and gets stored on the Desktop.

The visual cryptography tool will only work with PNG and JPEG images. The images involved with the encoding process must have the same dimensions. The tool can handle images of any coloring.

# Plans for Project

Iteration 1 (Sept. 11 – Oct. 9):

* Create a graphical user interface
* Get the tool working for strictly black and white images
* Test the tool to check the quality of the encoded shares and the decoded message

Iteration 2 (Oct. 10 – Nov. 6):

* Research visual cryptography schemes with gray scale images

Iteration 3 (Nov. 7 – Dec. 4):

* Implement the visual cryptography scheme with grayscale images
* Begin researching how to modify the current algorithm to handle color images

Iteration 4 (Dec. 5 – Jan. 1):

* Research how to add the ability to encode and decode multicolor images

Iteration 5 (Jan. 2 – Jan. 29):

* Implement the encoding and decoding of color images
* Add unit tests for the components of the visual cryptography tool

Iteration 6 (Jan. 30 – Feb. 26):

* Improve the encryption and decryption process by adding pixel expansion, ie 1 pixel in the cover image becomes 4 pixels in the encoded image
* Analyze the tool and look for ways to improve efficiency (performance and memory storage)
* Add features to project to help boost robustness (i.e. add in checks to keep the user from breaking the tool easily)
* Add unit tests for the components of the visual cryptography tool

# Plans for Iteration 6

* Improve the encryption and decryption process by adding pixel expansion, ie 1 pixel in the cover image becomes 4 pixels in the encoded image
* Analyze the tool and look for ways to improve efficiency (performance and memory storage)
* Add features to project to help boost robustness (i.e. add in checks to keep the user from breaking the tool easily)
* Add unit tests for the components of the visual cryptography tool

# Weekly Plans

Week 1:

|  |  |  |
| --- | --- | --- |
| Day | Expected Hours | Actual Hours |
| Saturday, January 30th | 0 | 0 |
| Sunday, January 31st | 0 | 0 |
| Monday, February 1st | 3 | 1 |
| Tuesday, February 2nd | 3 | 2 |
| Wednesday, February 3rd | 3 | 1 |
| Thursday, February 4th | 0 | 0 |
| Friday, February 5th | 0 | 0 |

Week 2:

|  |  |  |
| --- | --- | --- |
| Day | Expected Hours | Actual Hours |
| Saturday, February 6th | 0 | 0 |
| Sunday, February 7th | 0 | 0 |
| Monday, February 8th | 2 | 1 |
| Tuesday, February 9th | 0 | 2 |
| Wednesday, February 10th | 2 | 1.5 |
| Thursday, February 11th | 0 | 1 |
| Friday, February 12th | 3 | 3 |

Week 3:

|  |  |  |
| --- | --- | --- |
| Day | Expected Hours | Actual Hours |
| Saturday, February 13th | 0 | 4 |
| Sunday, February 14th | 0 | 3 |
| Monday, February 15th | 3 |  |
| Tuesday, February 16th | 4 |  |
| Wednesday, February 17th | 3 |  |
| Thursday, February 18th | 2 |  |
| Friday, February 19th | 4 |  |

Week 4:

|  |  |  |
| --- | --- | --- |
| Day | Expected Hours | Actual Hours |
| Saturday, February 20th |  |  |
| Sunday, February 21st |  |  |
| Monday, February 22nd |  |  |
| Tuesday, February 23rd |  |  |
| Wednesday, February 24th |  |  |
| Thursday, February 25th |  |  |
| Friday, February 26th |  |  |

# Design

Figure 1: UML Diagram from Iteration 1

Note the design has not changed since Iteration 2.

Before changing the Java files to handle the gray scale images, I exported the PlantUML diagram of the visual cryptography tool. Figure 1 shows the class relations.

In Iteration 4, I decided to focus on researching techniques for encrypting color images. The most promising technique I found came from Varalakshmi, R, and Parameswari, and it utilized Visual Information Pixel (VIP) synchronization. VIP synchronization helps hide the secret image pixel information inside the innocent pixels. The process for encrypting a secret image is as follows:

1. Gather and process the two innocent images and one secret image.
2. Half-tone the innocent images using error diffusion.
3. Split the secret image into three images. One image represents only the red concentration of the picture, the second represents the green concentration, and the third represents blue.
4. Perform VIP synchronization on the innocent images and the three secret images.
5. Use error diffusion on the encrypted shares to smooth any pixels that cause the encoded image to look as if they are hiding something.

Decryption for this technique does not require the user to have a computer. The images can be printed on transparencies and stacked to reveal the secret image.

# Construction - TBD

The decrypted results at the end of Iteration 5 were not promising. When I had first implemented the VIP synchronization, I tried to avoid the pixel expansion. Since the results were not promising, I decided to put the pixel expansion in the code and perform some visual tests. Now every pixel in the cover and secret images become four pixels in the encoded image.

The first test placed the secret red pixel and secret green pixel with two copies of the first innocent image

# Test - TBD

I was testing different images throughout the construction process. The second step of implementation was programming the error diffusion.

|  |
| --- |
|  |
| Figure 2: Original Images (left), Images after Error Diffusion (right) |

Figure 2 shows the results of performing error diffusion on two grayscale images. The puppy pictures appear to be the same, while the rose looks lighter after being processed. The technique worked well enough that, if you only saw the final images, you would not know anything was unusual about the photos.

After being satisfied with the error diffusion, I completed the implementation of the VIP synchronization by adding the code that combined the pixel information of the cover images and the secret image. The first test of the encryption and decryption process was with my grayscale images from Iteration 3. Figures 3 shows the original images. The encoded images are displayed in Figure 4, while Figure 5 shows the secret revealed from stacking the two images in Figure 4.

|  |
| --- |
|  |
| Figure 3: Secret Image to be Encoded (left), Innocent Image 1 (middle), Innocent Image 2 (right) |

|  |
| --- |
|  |
| Figure 4: Encoded Share A (left), Encoded Share B (right) |



Figure 5: Result of decoding shares A and B from Figure 4.

Encryption and Decryption Color Images

# Post Mortem - TBD

Need to research and check that VIP synchronization is actually being implemented properly. Check the resource paper. Need to extend the image dimension, ie 1 pixel becomes 4.

Samples for testing section

|  |
| --- |
|  |
| Figure 3: Secret Image to be Encoded (left), Innocent Image 1 (middle), Innocent Image 2 (right) |

|  |
| --- |
|  |
| Figure 3: Encoded Share A (left), Encoded Share B (right) |



Figure 4: Result of decoding shares A and B from Figure 3.

# Source Code

MainFrame.java

1 package Masters\_Proj;  
 2   
 3 /\*  
 4 \* To change this license header, choose License Headers in Project Properties.  
 5 \* To change this template file, choose Tools | Templates  
 6 \* and open the template in the editor.  
 7 \*/  
 8   
 9 /\*\*  
 10 \*  
 11 \* @author allisonholt  
 12 \*/  
 13 public class MainFrame extends javax.swing.JFrame {  
 14   
 15 /\*\*  
 16 \* Creates new form StartFrame  
 17 \*/  
 18 public MainFrame() {  
 19 initComponents();  
 20 this.setLocationRelativeTo(null);  
 21 }  
 22   
 23 /\*\*  
 24 \* This method is called from within the constructor to initialize the form.  
 25 \* WARNING: Do NOT modify this code. The content of this method is always  
 26 \* regenerated by the Form Editor.  
 27 \*/  
 28 @SuppressWarnings("unchecked")  
 29 // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents  
 30 private void initComponents() {  
 31   
 32 welcomeBanner = new javax.swing.JLabel();  
 33 jScrollPane1 = new javax.swing.JScrollPane();  
 34 descriptionArea = new javax.swing.JTextArea();  
 35 jScrollPane2 = new javax.swing.JScrollPane();  
 36 directionsArea = new javax.swing.JTextArea();  
 37 encodeButton = new javax.swing.JButton();  
 38 decodeButton = new javax.swing.JButton();  
 39   
 40 setDefaultCloseOperation(javax.swing.WindowConstants.EXIT\_ON\_CLOSE);  
 41 setTitle("Holt Visual Cryptography");  
 42   
 43 welcomeBanner.setHorizontalAlignment(javax.swing.SwingConstants.CENTER);  
 44 welcomeBanner.setText("Welcome to the Holt Visual Cryptography Tool!");  
 45   
 46 descriptionArea.setEditable(false);  
 47 descriptionArea.setColumns(20);  
 48 descriptionArea.setLineWrap(true);  
 49 descriptionArea.setRows(5);  
 50 descriptionArea.setText("The Holt Cryptography Tool allows you to encrypt or decrypt a secret image using extended visual cryptography. The secret image gets embedded into two innocent images that must be superimposed in order to reveal the secret information.");  
 51 descriptionArea.setWrapStyleWord(true);  
 52 jScrollPane1.setViewportView(descriptionArea);  
 53   
 54 directionsArea.setColumns(20);  
 55 directionsArea.setLineWrap(true);  
 56 directionsArea.setRows(5);  
 57 directionsArea.setText("If you wish to encrypt a secret image, then select the encode button. If you wish to decrypt a secret message, then select the decode button.");  
 58 directionsArea.setWrapStyleWord(true);  
 59 jScrollPane2.setViewportView(directionsArea);  
 60   
 61 encodeButton.setText("Encode");  
 62 encodeButton.addActionListener(  
 63 new java.awt.event.ActionListener() {  
 64 public void actionPerformed(java.awt.event.ActionEvent evt) {  
 65 encodePressed(evt);  
 66 }  
 67 });  
 68   
 69 decodeButton.setText("Decode");  
 70 decodeButton.setHorizontalAlignment(javax.swing.SwingConstants.RIGHT);  
 71 decodeButton.addActionListener(  
 72 new java.awt.event.ActionListener() {  
 73 public void actionPerformed(java.awt.event.ActionEvent evt) {  
 74 decodePressed(evt);  
 75 }  
 76 });  
 77   
 78 javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());  
 79 getContentPane().setLayout(layout);  
 80 layout.setHorizontalGroup(  
 81 layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
 82 .addComponent(welcomeBanner, javax.swing.GroupLayout.DEFAULT\_SIZE, 600, Short.MAX\_VALUE)  
 83 .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()  
 84 .addContainerGap()  
 85 .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)  
 86 .addComponent(jScrollPane2)  
 87 .addComponent(jScrollPane1))  
 88 .addContainerGap())  
 89 .addGroup(layout.createSequentialGroup()  
 90 .addGap(66, 66, 66)  
 91 .addComponent(encodeButton)  
 92 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
 93 .addComponent(decodeButton)  
 94 .addGap(66, 66, 66))  
 95 );  
 96 layout.setVerticalGroup(  
 97 layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
 98 .addGroup(layout.createSequentialGroup()  
 99 .addGap(24, 24, 24)  
100 .addComponent(welcomeBanner, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
101 .addGap(18, 18, 18)  
102 .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED\_SIZE, 64, javax.swing.GroupLayout.PREFERRED\_SIZE)  
103 .addGap(18, 18, 18)  
104 .addComponent(jScrollPane2, javax.swing.GroupLayout.PREFERRED\_SIZE, 47, javax.swing.GroupLayout.PREFERRED\_SIZE)  
105 .addGap(18, 18, 18)  
106 .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
107 .addComponent(encodeButton)  
108 .addComponent(decodeButton))  
109 .addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))  
110 );  
111   
112 pack();  
113 }// </editor-fold>//GEN-END:initComponents  
114   
115 private void encodePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_encodePressed  
116 // TODO add your handling code here:  
117 new EncodeFrame().setVisible(true);  
118 this.setVisible(false);  
119   
120 }//GEN-LAST:event\_encodePressed  
121   
122 private void decodePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_decodePressed  
123 // TODO add your handling code here:  
124 new DecodeFrame().setVisible(true);  
125 this.setVisible(false);  
126 }//GEN-LAST:event\_decodePressed  
127   
128 /\*\*  
129 \* @param args the command line arguments  
130 \*/  
131 public static void main(String args[]) {  
132 /\* Set the Nimbus look and feel \*/  
133 //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">  
134 /\* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.  
135 \* For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html   
136 \*/  
137 try {  
138 for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {  
139 if ("Nimbus".equals(info.getName())) {  
140 javax.swing.UIManager.setLookAndFeel(info.getClassName());  
141 break;  
142 }  
143 }  
144 }   
145 catch (ClassNotFoundException ex) {  
146 java.util.logging.Logger.getLogger(MainFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
147 }   
148 catch (InstantiationException ex) {  
149 java.util.logging.Logger.getLogger(MainFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
150 }   
151 catch (IllegalAccessException ex) {  
152 java.util.logging.Logger.getLogger(MainFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
153 }   
154 catch (javax.swing.UnsupportedLookAndFeelException ex) {  
155 java.util.logging.Logger.getLogger(MainFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
156 }  
157 //</editor-fold>  
158 //</editor-fold>  
159   
160 /\* Create and display the form \*/  
161 java.awt.EventQueue.invokeLater(  
162 new Runnable() {  
163 public void run() {  
164 new MainFrame().setVisible(true);  
165 }  
166 });  
167 }  
168   
169 // Variables declaration - do not modify//GEN-BEGIN:variables  
170 private javax.swing.JButton decodeButton;  
171 private javax.swing.JTextArea descriptionArea;  
172 private javax.swing.JTextArea directionsArea;  
173 private javax.swing.JButton encodeButton;  
174 private javax.swing.JScrollPane jScrollPane1;  
175 private javax.swing.JScrollPane jScrollPane2;  
176 private javax.swing.JLabel welcomeBanner;  
177 // End of variables declaration//GEN-END:variables  
178 }  
179

EncodeFrame.java

1 package Masters\_Proj;  
 2   
 3 import java.awt.image.BufferedImage;  
 4 import java.io.File;  
 5 import java.io.IOException;  
 6 import javax.imageio.ImageIO;  
 7 import javax.swing.JFileChooser;  
 8 import javax.swing.JOptionPane;  
 9   
 10 /\*  
 11 \* To change this license header, choose License Headers in Project Properties.  
 12 \* To change this template file, choose Tools | Templates  
 13 \* and open the template in the editor.  
 14 \*/  
 15   
 16 /\*\*  
 17 \*  
 18 \* @author allisonholt  
 19 \*/  
 20 public class EncodeFrame extends javax.swing.JFrame {  
 21   
 22 /\*\*  
 23 \* Creates new form EncodeFrame  
 24 \*/  
 25 public EncodeFrame() {  
 26 initComponents();  
 27 this.setLocationRelativeTo(null);  
 28 }  
 29   
 30 public EncodeFrame(EncodeFrame prevState)  
 31 {  
 32 this.secretTextField.setText(prevState.secretTextField.getText());  
 33 }  
 34   
 35 /\*\*  
 36 \* This method is called from within the constructor to initialize the form.  
 37 \* WARNING: Do NOT modify this code. The content of this method is always  
 38 \* regenerated by the Form Editor.  
 39 \*/  
 40 @SuppressWarnings("unchecked")  
 41 // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents  
 42 private void initComponents() {  
 43   
 44 imageChooser = new javax.swing.JFileChooser();  
 45 directoryChooser = new javax.swing.JFileChooser();  
 46 cancelButton = new javax.swing.JButton();  
 47 encodeButton = new javax.swing.JButton();  
 48 panel1 = new javax.swing.JPanel();  
 49 secretTextField = new javax.swing.JTextField();  
 50 jLabel1 = new javax.swing.JLabel();  
 51 browseButton1 = new javax.swing.JButton();  
 52 jPanel1 = new javax.swing.JPanel();  
 53 jLabel2 = new javax.swing.JLabel();  
 54 innocentTextField1 = new javax.swing.JTextField();  
 55 browseButton2 = new javax.swing.JButton();  
 56 innocentTextField2 = new javax.swing.JTextField();  
 57 browseButton3 = new javax.swing.JButton();  
 58 optionalPanel = new javax.swing.JPanel();  
 59 jLabel3 = new javax.swing.JLabel();  
 60 jLabel4 = new javax.swing.JLabel();  
 61 jLabel5 = new javax.swing.JLabel();  
 62 filename1 = new javax.swing.JTextField();  
 63 filename2 = new javax.swing.JTextField();  
 64 jLabel6 = new javax.swing.JLabel();  
 65 storageDirectoryTextField = new javax.swing.JTextField();  
 66 browseButton4 = new javax.swing.JButton();  
 67   
 68 imageChooser.setDialogTitle("Choose an Image");  
 69 imageChooser.setFileFilter(new ImageCustomFilter());  
 70   
 71 directoryChooser.setDialogTitle("Choose a Directory");  
 72 directoryChooser.setFileFilter(new DirectoryCustomFilter());  
 73 directoryChooser.setFileSelectionMode(javax.swing.JFileChooser.DIRECTORIES\_ONLY);  
 74   
 75 setDefaultCloseOperation(javax.swing.WindowConstants.EXIT\_ON\_CLOSE);  
 76 setResizable(false);  
 77   
 78 cancelButton.setText("Cancel");  
 79 cancelButton.addActionListener(  
 80 new java.awt.event.ActionListener() {  
 81 public void actionPerformed(java.awt.event.ActionEvent evt) {  
 82 cancelPressed(evt);  
 83 }  
 84 });  
 85   
 86 encodeButton.setText("Encode");  
 87 encodeButton.addActionListener(  
 88 new java.awt.event.ActionListener() {  
 89 public void actionPerformed(java.awt.event.ActionEvent evt) {  
 90 encodePressed(evt);  
 91 }  
 92 });  
 93   
 94 panel1.setBorder(javax.swing.BorderFactory.createTitledBorder("Secret Image"));  
 95 panel1.setToolTipText("Secret Image");  
 96   
 97 jLabel1.setText("Please select your secret image file:\*");  
 98   
 99 browseButton1.setText("Browse");  
100 browseButton1.addActionListener(  
101 new java.awt.event.ActionListener() {  
102 public void actionPerformed(java.awt.event.ActionEvent evt) {  
103 imageBrowsePressed(evt);  
104 }  
105 });  
106   
107 javax.swing.GroupLayout panel1Layout = new javax.swing.GroupLayout(panel1);  
108 panel1.setLayout(panel1Layout);  
109 panel1Layout.setHorizontalGroup(  
110 panel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
111 .addGroup(panel1Layout.createSequentialGroup()  
112 .addComponent(jLabel1)  
113 .addGap(0, 0, Short.MAX\_VALUE))  
114 .addGroup(panel1Layout.createSequentialGroup()  
115 .addComponent(secretTextField)  
116 .addGap(18, 18, 18)  
117 .addComponent(browseButton1))  
118 );  
119 panel1Layout.setVerticalGroup(  
120 panel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
121 .addGroup(panel1Layout.createSequentialGroup()  
122 .addContainerGap()  
123 .addComponent(jLabel1)  
124 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
125 .addGroup(panel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
126 .addComponent(secretTextField, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
127 .addComponent(browseButton1))  
128 .addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))  
129 );  
130   
131 jPanel1.setBorder(javax.swing.BorderFactory.createTitledBorder("Innocent Images"));  
132   
133 jLabel2.setText("Please select your two innocent image files:\*");  
134   
135 browseButton2.setText("Browse");  
136 browseButton2.addActionListener(  
137 new java.awt.event.ActionListener() {  
138 public void actionPerformed(java.awt.event.ActionEvent evt) {  
139 imageBrowsePressed(evt);  
140 }  
141 });  
142   
143 browseButton3.setText("Browse");  
144 browseButton3.addActionListener(  
145 new java.awt.event.ActionListener() {  
146 public void actionPerformed(java.awt.event.ActionEvent evt) {  
147 imageBrowsePressed(evt);  
148 }  
149 });  
150   
151 javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);  
152 jPanel1.setLayout(jPanel1Layout);  
153 jPanel1Layout.setHorizontalGroup(  
154 jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
155 .addGroup(jPanel1Layout.createSequentialGroup()  
156 .addContainerGap()  
157 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
158 .addGroup(jPanel1Layout.createSequentialGroup()  
159 .addComponent(jLabel2)  
160 .addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))  
161 .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()  
162 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)  
163 .addComponent(innocentTextField2, javax.swing.GroupLayout.Alignment.LEADING)  
164 .addComponent(innocentTextField1))  
165 .addGap(18, 18, 18)  
166 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
167 .addComponent(browseButton2)  
168 .addComponent(browseButton3)))))  
169 );  
170 jPanel1Layout.setVerticalGroup(  
171 jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
172 .addGroup(jPanel1Layout.createSequentialGroup()  
173 .addContainerGap()  
174 .addComponent(jLabel2)  
175 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
176 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
177 .addComponent(innocentTextField1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
178 .addComponent(browseButton2))  
179 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
180 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
181 .addComponent(innocentTextField2, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
182 .addComponent(browseButton3))  
183 .addContainerGap(10, Short.MAX\_VALUE))  
184 );  
185   
186 optionalPanel.setBorder(javax.swing.BorderFactory.createTitledBorder("Optional"));  
187   
188 jLabel3.setText("Names for your encoded shares (without file extension):");  
189   
190 jLabel4.setText("File 1:");  
191   
192 jLabel5.setText("File 2:");  
193   
194 jLabel6.setText("Directory for Image Shares:");  
195   
196 browseButton4.setText("Browse");  
197 browseButton4.addActionListener(  
198 new java.awt.event.ActionListener() {  
199 public void actionPerformed(java.awt.event.ActionEvent evt) {  
200 dirBrowsePressed(evt);  
201 }  
202 });  
203   
204 javax.swing.GroupLayout optionalPanelLayout = new javax.swing.GroupLayout(optionalPanel);  
205 optionalPanel.setLayout(optionalPanelLayout);  
206 optionalPanelLayout.setHorizontalGroup(  
207 optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
208 .addGroup(optionalPanelLayout.createSequentialGroup()  
209 .addContainerGap()  
210 .addGroup(optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
211 .addGroup(optionalPanelLayout.createSequentialGroup()  
212 .addGroup(optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
213 .addComponent(jLabel3)  
214 .addComponent(jLabel6))  
215 .addContainerGap())  
216 .addGroup(optionalPanelLayout.createSequentialGroup()  
217 .addGap(6, 6, 6)  
218 .addGroup(optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
219 .addGroup(optionalPanelLayout.createSequentialGroup()  
220 .addComponent(jLabel5)  
221 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
222 .addComponent(filename2))  
223 .addGroup(optionalPanelLayout.createSequentialGroup()  
224 .addComponent(jLabel4)  
225 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
226 .addComponent(filename1))  
227 .addGroup(optionalPanelLayout.createSequentialGroup()  
228 .addGap(0, 3, Short.MAX\_VALUE)  
229 .addComponent(storageDirectoryTextField, javax.swing.GroupLayout.PREFERRED\_SIZE, 480, javax.swing.GroupLayout.PREFERRED\_SIZE)  
230 .addGap(18, 18, 18)  
231 .addComponent(browseButton4))))))  
232 );  
233 optionalPanelLayout.setVerticalGroup(  
234 optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
235 .addGroup(optionalPanelLayout.createSequentialGroup()  
236 .addContainerGap()  
237 .addComponent(jLabel3)  
238 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
239 .addGroup(optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
240 .addComponent(jLabel4)  
241 .addComponent(filename1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))  
242 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
243 .addGroup(optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
244 .addComponent(jLabel5)  
245 .addComponent(filename2, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))  
246 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
247 .addComponent(jLabel6)  
248 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
249 .addGroup(optionalPanelLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
250 .addComponent(storageDirectoryTextField, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
251 .addComponent(browseButton4))  
252 .addGap(0, 6, Short.MAX\_VALUE))  
253 );  
254   
255 javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());  
256 getContentPane().setLayout(layout);  
257 layout.setHorizontalGroup(  
258 layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
259 .addGroup(layout.createSequentialGroup()  
260 .addContainerGap()  
261 .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
262 .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()  
263 .addGap(0, 0, Short.MAX\_VALUE)  
264 .addComponent(encodeButton)  
265 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
266 .addComponent(cancelButton))  
267 .addComponent(panel1, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
268 .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
269 .addComponent(optionalPanel, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))  
270 .addContainerGap())  
271 );  
272 layout.setVerticalGroup(  
273 layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
274 .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()  
275 .addContainerGap()  
276 .addComponent(panel1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
277 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
278 .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
279 .addGap(12, 12, 12)  
280 .addComponent(optionalPanel, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
281 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
282 .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
283 .addComponent(cancelButton)  
284 .addComponent(encodeButton))  
285 .addContainerGap())  
286 );  
287   
288 pack();  
289 }// </editor-fold>//GEN-END:initComponents  
290   
291 private void cancelPressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_cancelPressed  
292 // TODO add your handling code here:  
293 this.setVisible(false);  
294 new MainFrame().setVisible(true);  
295 }//GEN-LAST:event\_cancelPressed  
296   
297 private void dirBrowsePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_dirBrowsePressed  
298   
299 int returnVal = directoryChooser.showOpenDialog(this);  
300 if(returnVal == JFileChooser.APPROVE\_OPTION)  
301 {  
302 File dir = directoryChooser.getSelectedFile();  
303 if(evt.getSource() == browseButton4)  
304 {  
305 storageDirectoryTextField.setText(dir.getAbsolutePath());  
306 directoryForStorage = dir.getAbsolutePath();  
307 }  
308 }  
309   
310 }//GEN-LAST:event\_dirBrowsePressed  
311   
312 private void imageBrowsePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_imageBrowsePressed  
313   
314 int returnVal = imageChooser.showOpenDialog(this);  
315 if(returnVal == JFileChooser.APPROVE\_OPTION)  
316 {  
317 File imageFile = imageChooser.getSelectedFile();  
318 if(evt.getSource() == browseButton1)  
319 {  
320 secretTextField.setText(imageFile.getAbsolutePath());  
321 secretFile = imageFile.getAbsolutePath();  
322 }  
323 else if(evt.getSource() == browseButton2)  
324 {  
325 innocentTextField1.setText(imageFile.getAbsolutePath());  
326 innocentFiles[0] = imageFile.getAbsolutePath();  
327 }  
328 else if(evt.getSource() == browseButton3)  
329 {  
330 innocentTextField2.setText(imageFile.getAbsolutePath());  
331 innocentFiles[1] = imageFile.getAbsolutePath();  
332 }  
333 }  
334 }//GEN-LAST:event\_imageBrowsePressed  
335   
336 private void encodePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_encodePressed  
337 //Code to encode secret message  
338 BufferedImage secretImage = null;  
339 boolean fileFound;  
340 try  
341 {  
342 secretImage = ImageIO.read(new File(secretFile));  
343 fileFound = true;  
344 }  
345 catch (IOException e)  
346 {  
347 JOptionPane.showMessageDialog(null, "Error reading your secret file",  
348 "ERROR", JOptionPane.ERROR\_MESSAGE);  
349 fileFound = false;  
350 }  
351   
352 BufferedImage[] innocentShares = new BufferedImage[0];  
353 if(fileFound)  
354 {  
355 innocentShares = new BufferedImage[2];  
356 for(int i = 0; i < 2; i++)  
357 {  
358 try  
359 {  
360 innocentShares[i] = ImageIO.read(new File(innocentFiles[i]));  
361 fileFound = true;  
362 }  
363 catch(IOException e)  
364 {  
365 JOptionPane.showMessageDialog(null,   
366 ("Error reading innocent file " + (i + 1)),  
367 "ERROR", JOptionPane.ERROR\_MESSAGE);  
368 fileFound = false;  
369 }  
370 }  
371 }  
372   
373 if(fileFound)  
374 {  
375 ExtendedVCS myEVCS = new ExtendedVCS(secretImage, innocentShares);  
376 myEVCS.encryptImage();  
377   
378 int[][] encodedRGB = myEVCS.getRGBPixelsForShares();  
379   
380 if(storageDirectoryTextField.getText().equals(""))  
381 {  
382 //Get path to users desktop  
383 //BUG!!! Not working.  
384 directoryForStorage = "C:/Users/allisonholt/Desktop";  
385 //makeDir = false;  
386 }  
387   
388 String[] shareFiles = new String[2];  
389   
390 if(filename1.getText().equals(""))  
391 {  
392 shareFiles[0] = directoryForStorage + "/share1.png";  
393 }  
394 else  
395 {  
396 shareFiles[0] = directoryForStorage + "/" + filename1.getText() +".png";  
397 }  
398   
399 if(filename2.getText().equals(""))  
400 {  
401 shareFiles[1] = directoryForStorage + "/share2.png";  
402 }  
403 else  
404 {  
405 shareFiles[1] = directoryForStorage + "/" + filename2.getText() +".png";  
406 }  
407   
408   
409 try  
410 {  
411 BufferedImage tempShare1 = new BufferedImage(myEVCS.getImgWidth(), myEVCS.getImgHeight(), BufferedImage.TYPE\_INT\_RGB);  
412 tempShare1.setRGB(0, 0, myEVCS.getImgWidth(), myEVCS.getImgHeight(), encodedRGB[0], 0, myEVCS.getImgWidth());  
413 File tempOutput1 = new File(shareFiles[0]);  
414 ImageIO.write(tempShare1, "png", tempOutput1);  
415   
416 BufferedImage tempShare2 = new BufferedImage(myEVCS.getImgWidth(), myEVCS.getImgHeight(), BufferedImage.TYPE\_INT\_RGB);  
417 tempShare2.setRGB(0, 0, myEVCS.getImgWidth(), myEVCS.getImgHeight(), encodedRGB[1], 0, myEVCS.getImgWidth());  
418 File tempOutput2 = new File(shareFiles[1]);  
419 ImageIO.write(tempShare2, "png", tempOutput2);  
420   
421 new MainFrame().setVisible(true);  
422 this.setVisible(false);  
423 JOptionPane.showMessageDialog(null, "Your encrypted shares have been created.",  
424 "SUCCESS", JOptionPane.PLAIN\_MESSAGE);  
425 }  
426 catch (IOException e)  
427 {  
428 JOptionPane.showMessageDialog(null, "Error encrypting your secret message",  
429 "ERROR", JOptionPane.ERROR\_MESSAGE);  
430 }  
431   
432 }  
433 }//GEN-LAST:event\_encodePressed  
434   
435 /\*\*  
436 \* @param args the command line arguments  
437 \*/  
438 public static void main(String args[]) {  
439 /\* Set the Nimbus look and feel \*/  
440 //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">  
441 /\* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.  
442 \* For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html   
443 \*/  
444 try {  
445 for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {  
446 if ("Nimbus".equals(info.getName())) {  
447 javax.swing.UIManager.setLookAndFeel(info.getClassName());  
448 break;  
449 }  
450 }  
451 }   
452 catch (ClassNotFoundException ex) {  
453 java.util.logging.Logger.getLogger(EncodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
454 }   
455 catch (InstantiationException ex) {  
456 java.util.logging.Logger.getLogger(EncodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
457 }   
458 catch (IllegalAccessException ex) {  
459 java.util.logging.Logger.getLogger(EncodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
460 }   
461 catch (javax.swing.UnsupportedLookAndFeelException ex) {  
462 java.util.logging.Logger.getLogger(EncodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
463 }  
464 //</editor-fold>  
465   
466 /\* Create and display the form \*/  
467 java.awt.EventQueue.invokeLater(  
468 new Runnable() {  
469 public void run() {  
470 new EncodeFrame().setVisible(true);  
471 }  
472 });  
473 }  
474   
475 //Variables for encoding  
476 private String secretFile = "";  
477 private String[] innocentFiles = new String[2];  
478 private String directoryForStorage = "";  
479   
480 // Variables declaration - do not modify//GEN-BEGIN:variables  
481 private javax.swing.JButton browseButton1;  
482 private javax.swing.JButton browseButton2;  
483 private javax.swing.JButton browseButton3;  
484 private javax.swing.JButton browseButton4;  
485 private javax.swing.JButton cancelButton;  
486 private javax.swing.JFileChooser directoryChooser;  
487 private javax.swing.JButton encodeButton;  
488 private javax.swing.JTextField filename1;  
489 private javax.swing.JTextField filename2;  
490 private javax.swing.JFileChooser imageChooser;  
491 private javax.swing.JTextField innocentTextField1;  
492 private javax.swing.JTextField innocentTextField2;  
493 private javax.swing.JLabel jLabel1;  
494 private javax.swing.JLabel jLabel2;  
495 private javax.swing.JLabel jLabel3;  
496 private javax.swing.JLabel jLabel4;  
497 private javax.swing.JLabel jLabel5;  
498 private javax.swing.JLabel jLabel6;  
499 private javax.swing.JPanel jPanel1;  
500 private javax.swing.JPanel optionalPanel;  
501 private javax.swing.JPanel panel1;  
502 private javax.swing.JTextField secretTextField;  
503 private javax.swing.JTextField storageDirectoryTextField;  
504 // End of variables declaration//GEN-END:variables  
505 }  
506

DecodeFrame.java

1 /\*  
 2 \* To change this license header, choose License Headers in Project Properties.  
 3 \* To change this template file, choose Tools | Templates  
 4 \* and open the template in the editor.  
 5 \*/  
 6 package Masters\_Proj;  
 7   
 8 import java.awt.image.BufferedImage;  
 9 import java.io.File;  
 10 import java.io.IOException;  
 11 import javax.imageio.ImageIO;  
 12 import javax.swing.JFileChooser;  
 13 import javax.swing.JOptionPane;  
 14   
 15 /\*\*  
 16 \*  
 17 \* @author allisonholt  
 18 \*/  
 19 public class DecodeFrame extends javax.swing.JFrame {  
 20   
 21 /\*\*  
 22 \* Creates new form DecodeFrame  
 23 \*/  
 24 public DecodeFrame() {  
 25 initComponents();  
 26 this.setLocationRelativeTo(null);  
 27 }  
 28   
 29 /\*\*  
 30 \* This method is called from within the constructor to initialize the form.  
 31 \* WARNING: Do NOT modify this code. The content of this method is always  
 32 \* regenerated by the Form Editor.  
 33 \*/  
 34 @SuppressWarnings("unchecked")  
 35 // <editor-fold defaultstate="collapsed" desc="Generated Code">//GEN-BEGIN:initComponents  
 36 private void initComponents() {  
 37   
 38 imageChooser = new javax.swing.JFileChooser();  
 39 directoryChooser = new javax.swing.JFileChooser();  
 40 jPanel1 = new javax.swing.JPanel();  
 41 jLabel1 = new javax.swing.JLabel();  
 42 encodedTextField1 = new javax.swing.JTextField();  
 43 browseButton1 = new javax.swing.JButton();  
 44 encodedTextField2 = new javax.swing.JTextField();  
 45 browseButton2 = new javax.swing.JButton();  
 46 jPanel2 = new javax.swing.JPanel();  
 47 jLabel2 = new javax.swing.JLabel();  
 48 jLabel3 = new javax.swing.JLabel();  
 49 stackedTextField = new javax.swing.JTextField();  
 50 jLabel4 = new javax.swing.JLabel();  
 51 storageDirectoryTextField = new javax.swing.JTextField();  
 52 browseButton3 = new javax.swing.JButton();  
 53 jButton2 = new javax.swing.JButton();  
 54 jButton3 = new javax.swing.JButton();  
 55   
 56 imageChooser.setDialogTitle("Choose an Image");  
 57 imageChooser.setFileFilter(new ImageCustomFilter());  
 58   
 59 directoryChooser.setDialogTitle("Choose a Directory");  
 60 directoryChooser.setFileFilter(new DirectoryCustomFilter());  
 61 directoryChooser.setFileSelectionMode(javax.swing.JFileChooser.DIRECTORIES\_ONLY);  
 62   
 63 setDefaultCloseOperation(javax.swing.WindowConstants.EXIT\_ON\_CLOSE);  
 64   
 65 jPanel1.setBorder(javax.swing.BorderFactory.createTitledBorder("Encoded Images"));  
 66   
 67 jLabel1.setText("Please select your two encoded image files:\*");  
 68   
 69 browseButton1.setText("Browse");  
 70 browseButton1.addActionListener(  
 71 new java.awt.event.ActionListener() {  
 72 public void actionPerformed(java.awt.event.ActionEvent evt) {  
 73 imageBrowsePressed(evt);  
 74 }  
 75 });  
 76   
 77 browseButton2.setText("Browse");  
 78 browseButton2.addActionListener(  
 79 new java.awt.event.ActionListener() {  
 80 public void actionPerformed(java.awt.event.ActionEvent evt) {  
 81 imageBrowsePressed(evt);  
 82 }  
 83 });  
 84   
 85 javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);  
 86 jPanel1.setLayout(jPanel1Layout);  
 87 jPanel1Layout.setHorizontalGroup(  
 88 jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
 89 .addGroup(jPanel1Layout.createSequentialGroup()  
 90 .addContainerGap()  
 91 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
 92 .addGroup(jPanel1Layout.createSequentialGroup()  
 93 .addComponent(jLabel1)  
 94 .addGap(0, 310, Short.MAX\_VALUE))  
 95 .addGroup(jPanel1Layout.createSequentialGroup()  
 96 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)  
 97 .addComponent(encodedTextField2)  
 98 .addComponent(encodedTextField1))  
 99 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
100 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
101 .addComponent(browseButton1)  
102 .addComponent(browseButton2))))  
103 .addContainerGap())  
104 );  
105 jPanel1Layout.setVerticalGroup(  
106 jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
107 .addGroup(jPanel1Layout.createSequentialGroup()  
108 .addContainerGap()  
109 .addComponent(jLabel1)  
110 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
111 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
112 .addComponent(encodedTextField1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
113 .addComponent(browseButton1))  
114 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
115 .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
116 .addComponent(encodedTextField2, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
117 .addComponent(browseButton2))  
118 .addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))  
119 );  
120   
121 jPanel2.setBorder(javax.swing.BorderFactory.createTitledBorder("Optional"));  
122   
123 jLabel2.setText("File Name for Decrypted Secret:");  
124   
125 jLabel3.setText("Name (without extension):");  
126   
127 jLabel4.setText("Directory for Decrypted Image:");  
128   
129 browseButton3.setText("Browse");  
130 browseButton3.addActionListener(  
131 new java.awt.event.ActionListener() {  
132 public void actionPerformed(java.awt.event.ActionEvent evt) {  
133 directoryBrowsePressed(evt);  
134 }  
135 });  
136   
137 javax.swing.GroupLayout jPanel2Layout = new javax.swing.GroupLayout(jPanel2);  
138 jPanel2.setLayout(jPanel2Layout);  
139 jPanel2Layout.setHorizontalGroup(  
140 jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
141 .addGroup(jPanel2Layout.createSequentialGroup()  
142 .addContainerGap()  
143 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
144 .addGroup(jPanel2Layout.createSequentialGroup()  
145 .addComponent(jLabel2)  
146 .addGap(0, 0, Short.MAX\_VALUE))  
147 .addGroup(jPanel2Layout.createSequentialGroup()  
148 .addGap(6, 6, 6)  
149 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
150 .addGroup(jPanel2Layout.createSequentialGroup()  
151 .addComponent(jLabel3)  
152 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
153 .addComponent(stackedTextField))  
154 .addGroup(jPanel2Layout.createSequentialGroup()  
155 .addComponent(jLabel4)  
156 .addGap(0, 0, Short.MAX\_VALUE))  
157 .addGroup(jPanel2Layout.createSequentialGroup()  
158 .addComponent(storageDirectoryTextField)  
159 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
160 .addComponent(browseButton3)))))  
161 .addContainerGap())  
162 );  
163 jPanel2Layout.setVerticalGroup(  
164 jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
165 .addGroup(jPanel2Layout.createSequentialGroup()  
166 .addContainerGap()  
167 .addComponent(jLabel2)  
168 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
169 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
170 .addComponent(jLabel3)  
171 .addComponent(stackedTextField, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))  
172 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
173 .addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)  
174 .addGroup(jPanel2Layout.createSequentialGroup()  
175 .addComponent(jLabel4)  
176 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
177 .addComponent(storageDirectoryTextField, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE))  
178 .addComponent(browseButton3))  
179 .addContainerGap(19, Short.MAX\_VALUE))  
180 );  
181   
182 jButton2.setText("Cancel");  
183 jButton2.addActionListener(  
184 new java.awt.event.ActionListener() {  
185 public void actionPerformed(java.awt.event.ActionEvent evt) {  
186 cancelPressed(evt);  
187 }  
188 });  
189   
190 jButton3.setText("Decode");  
191 jButton3.addActionListener(  
192 new java.awt.event.ActionListener() {  
193 public void actionPerformed(java.awt.event.ActionEvent evt) {  
194 decodePressed(evt);  
195 }  
196 });  
197   
198 javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());  
199 getContentPane().setLayout(layout);  
200 layout.setHorizontalGroup(  
201 layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
202 .addGroup(layout.createSequentialGroup()  
203 .addContainerGap()  
204 .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
205 .addComponent(jPanel2, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
206 .addComponent(jPanel1, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE)  
207 .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, layout.createSequentialGroup()  
208 .addGap(0, 0, Short.MAX\_VALUE)  
209 .addComponent(jButton3)  
210 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
211 .addComponent(jButton2)))  
212 .addContainerGap())  
213 );  
214 layout.setVerticalGroup(  
215 layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
216 .addGroup(layout.createSequentialGroup()  
217 .addContainerGap()  
218 .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
219 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
220 .addComponent(jPanel2, javax.swing.GroupLayout.PREFERRED\_SIZE, javax.swing.GroupLayout.DEFAULT\_SIZE, javax.swing.GroupLayout.PREFERRED\_SIZE)  
221 .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)  
222 .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)  
223 .addComponent(jButton2)  
224 .addComponent(jButton3))  
225 .addContainerGap(javax.swing.GroupLayout.DEFAULT\_SIZE, Short.MAX\_VALUE))  
226 );  
227   
228 pack();  
229 }// </editor-fold>//GEN-END:initComponents  
230   
231 private void cancelPressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_cancelPressed  
232 // TODO add your handling code here:  
233 this.setVisible(false);  
234 new MainFrame().setVisible(true);  
235 }//GEN-LAST:event\_cancelPressed  
236   
237 private void imageBrowsePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_imageBrowsePressed  
238 // TODO add your handling code here:  
239 int returnVal = imageChooser.showOpenDialog(this);  
240 if(returnVal == JFileChooser.APPROVE\_OPTION)  
241 {  
242 File imageFile = imageChooser.getSelectedFile();  
243 if(evt.getSource() == browseButton1)  
244 {  
245 encodedTextField1.setText(imageFile.getAbsolutePath());  
246 shareFiles[0] = imageFile.getAbsolutePath();  
247 }  
248 else if(evt.getSource() == browseButton2)  
249 {  
250 encodedTextField2.setText(imageFile.getAbsolutePath());  
251 shareFiles[1] = imageFile.getAbsolutePath();  
252 }  
253 }  
254 }//GEN-LAST:event\_imageBrowsePressed  
255   
256 private void directoryBrowsePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_directoryBrowsePressed  
257 // TODO add your handling code here:  
258 int returnVal = directoryChooser.showOpenDialog(this);  
259 if(returnVal == JFileChooser.APPROVE\_OPTION)  
260 {  
261 File dir = directoryChooser.getSelectedFile();  
262 if(evt.getSource() == browseButton3)  
263 {  
264 storageDirectoryTextField.setText(dir.getAbsolutePath());  
265 directoryForStorage = dir.getAbsolutePath();  
266 }  
267 }  
268 }//GEN-LAST:event\_directoryBrowsePressed  
269   
270 private void decodePressed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event\_decodePressed  
271 // TODO add your handling code here:  
272 BufferedImage[] sharesEVCS = new BufferedImage[2];  
273 boolean fileFound = false;  
274   
275 for(int i = 0; i < 2; i++)  
276 {  
277 try  
278 {  
279 sharesEVCS[i] = ImageIO.read(new File(shareFiles[i]));  
280 fileFound = true;  
281 }  
282 catch(IOException e)  
283 {  
284 JOptionPane.showMessageDialog(null,   
285 ("Error reading file share" + (i + 1)),  
286 "ERROR", JOptionPane.ERROR\_MESSAGE);  
287 fileFound = false;  
288 }  
289 }  
290   
291 if(fileFound)  
292 {  
293 ExtendedVCS myEVCS = new ExtendedVCS(sharesEVCS);  
294 myEVCS.decryptImage();  
295   
296 if(storageDirectoryTextField.getText().equals(""))  
297 {  
298 //Get path to users desktop  
299 //BUG!!! Not working.  
300 directoryForStorage = "C:/Users/allisonholt/Desktop";  
301 //makeDir = false;  
302 }  
303   
304 String decodedFileName;  
305 if(stackedTextField.getText().equals(""))  
306 {  
307 //Get path to users desktop  
308 //BUG!!! Not working.  
309 decodedFileName = directoryForStorage + "/secretMsg.png";  
310 //makeDir = false;  
311 }  
312 else  
313 {  
314 decodedFileName = directoryForStorage + "/" + stackedTextField.getText() + ".png";  
315 }  
316   
317 try  
318 {  
319 BufferedImage decryptImage = new BufferedImage(myEVCS.getImgWidth(), myEVCS.getImgHeight(), BufferedImage.TYPE\_INT\_ARGB);  
320 decryptImage.setRGB(0, 0, myEVCS.getImgWidth(), myEVCS.getImgHeight(), myEVCS.getDecryptImgPixels(), 0, myEVCS.getImgWidth());  
321   
322 File tempOutput = new File(decodedFileName);  
323 ImageIO.write(decryptImage, "png", tempOutput);  
324   
325 new MainFrame().setVisible(true);  
326 this.setVisible(false);  
327 JOptionPane.showMessageDialog(null, "Your decrypted image has been created.",  
328 "SUCCESS", JOptionPane.PLAIN\_MESSAGE);  
329 }  
330 catch(IOException e)  
331 {  
332 JOptionPane.showMessageDialog(null, "Error decrypting your secret message",  
333 "ERROR", JOptionPane.ERROR\_MESSAGE);  
334 }  
335   
336 }  
337 }//GEN-LAST:event\_decodePressed  
338   
339 /\*\*  
340 \* @param args the command line arguments  
341 \*/  
342 public static void main(String args[]) {  
343 /\* Set the Nimbus look and feel \*/  
344 //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">  
345 /\* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.  
346 \* For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html   
347 \*/  
348 try {  
349 for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {  
350 if ("Nimbus".equals(info.getName())) {  
351 javax.swing.UIManager.setLookAndFeel(info.getClassName());  
352 break;  
353 }  
354 }  
355 }   
356 catch (ClassNotFoundException ex) {  
357 java.util.logging.Logger.getLogger(DecodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
358 }   
359 catch (InstantiationException ex) {  
360 java.util.logging.Logger.getLogger(DecodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
361 }   
362 catch (IllegalAccessException ex) {  
363 java.util.logging.Logger.getLogger(DecodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
364 }   
365 catch (javax.swing.UnsupportedLookAndFeelException ex) {  
366 java.util.logging.Logger.getLogger(DecodeFrame.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);  
367 }  
368 //</editor-fold>  
369   
370 /\* Create and display the form \*/  
371 java.awt.EventQueue.invokeLater(  
372 new Runnable() {  
373 public void run() {  
374 new DecodeFrame().setVisible(true);  
375 }  
376 });  
377 }  
378 //Variables for decoding  
379 private String[] shareFiles = new String[2];  
380 private String directoryForStorage = "";  
381   
382 // Variables declaration - do not modify//GEN-BEGIN:variables  
383 private javax.swing.JButton browseButton1;  
384 private javax.swing.JButton browseButton2;  
385 private javax.swing.JButton browseButton3;  
386 private javax.swing.JFileChooser directoryChooser;  
387 private javax.swing.JTextField encodedTextField1;  
388 private javax.swing.JTextField encodedTextField2;  
389 private javax.swing.JFileChooser imageChooser;  
390 private javax.swing.JButton jButton2;  
391 private javax.swing.JButton jButton3;  
392 private javax.swing.JLabel jLabel1;  
393 private javax.swing.JLabel jLabel2;  
394 private javax.swing.JLabel jLabel3;  
395 private javax.swing.JLabel jLabel4;  
396 private javax.swing.JPanel jPanel1;  
397 private javax.swing.JPanel jPanel2;  
398 private javax.swing.JTextField stackedTextField;  
399 private javax.swing.JTextField storageDirectoryTextField;  
400 // End of variables declaration//GEN-END:variables  
401 }  
402

ImageCustomFilter.java

1 /\*  
 2 \* To change this license header, choose License Headers in Project Properties.  
 3 \* To change this template file, choose Tools | Templates  
 4 \* and open the template in the editor.  
 5 \*/  
 6 package Masters\_Proj;  
 7   
 8 import java.io.File;  
 9   
10 /\*\*  
11 \*  
12 \* @author allisonholt  
13 \*/  
14 public class ImageCustomFilter extends javax.swing.filechooser.FileFilter {  
15   
16 @Override  
17 public boolean accept(File file)  
18 {  
19 //allow only image file  
20 return file.isDirectory() || file.getAbsolutePath().endsWith(".png")  
21 || file.getAbsolutePath().endsWith(".jpeg")  
22 || file.getAbsolutePath().endsWith(".jpg");  
23 }  
24   
25 @Override  
26 public String getDescription()  
27 {  
28 return "Image files (\*.png, \*.jpeg, \*.jpg)";  
29 }  
30   
31 }  
32

DirectoryCustomFilter.java

1 /\*  
 2 \* To change this license header, choose License Headers in Project Properties.  
 3 \* To change this template file, choose Tools | Templates  
 4 \* and open the template in the editor.  
 5 \*/  
 6 package Masters\_Proj;  
 7   
 8 import java.io.File;  
 9   
10 /\*\*  
11 \*  
12 \* @author allisonholt  
13 \*/  
14 public class DirectoryCustomFilter extends javax.swing.filechooser.FileFilter{  
15   
16 @Override  
17 public boolean accept(File file)  
18 {  
19 //allow only image file  
20 return file.isDirectory();  
21 }  
22   
23 @Override  
24 public String getDescription()  
25 {  
26 return "File Directory";  
27 }  
28 }  
29

ExtendedVCS.java

TBD

Pixel.java

1 /\*  
 2 \* To change this license header, choose License Headers in Project Properties.  
 3 \* To change this template file, choose Tools | Templates  
 4 \* and open the template in the editor.  
 5 \*/  
 6 package Masters\_Proj;  
 7 import java.awt.Color;  
 8   
 9 /\*\*  
10 \*  
11 \* @author allisonholt  
12 \*/  
13 public class Pixel   
14 {  
15   
16 private int redVal;  
17 private int greenVal;  
18 private int blueVal;  
19   
20 public Pixel(int redIn, int greenIn, int blueIn)  
21 {  
22 redVal = redIn;  
23 greenVal = greenIn;  
24 blueVal = blueIn;  
25 }  
26   
27 //Used to determine if pixel is closer to white than black  
28 public int getConcentration(char color)  
29 {  
30 if(color == 'r')  
31 return redVal;  
32 else if(color == 'g')  
33 return greenVal;  
34 else  
35 return blueVal;  
36 }  
37   
38 }  
39