

# COMP3419

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## 1 Introduction

COMP3419 Assignment - Option 1

This task is done by tracking the motion of monkey and replace my character Emma as marionette. She will interact with two sides characters occur two events. That is done by Processing about morphological operations and non-marker-color algorithm which will be introduced below.

## 2 Scene

Background: China Town located in America during War II.

Main character (the moving marionette):

- Emma, an elegant western noblewoman, John's wife. Mei made her looks like split the arms and legs.

Side Characters:

- Mei: a kind Chinese lady with green cheongsam. She will move out from the margin to attack Emma. When she touches Emma, she will wear white dress and hold the knives and then disappeared.
- Owl: it can purify the ghost. For protecting Emma, it will disperse Mei if it touches her and around white circle to limit her.

## 3 Story

In 1931, Mei was a student in degree of English). Meanwhile, Chinese incurred War of Resistance against Japan. She has to flee from the War.

Fortunately, Mei met a gentleman named John, a western nobleman. Mei is exceedingly fascinating and charming, so, John fell in love with Mei under red Chinese style umbrella. John said he loved her dark eyes and he want Mei to be his wife, so Mei also accompanied John to America. However, his parents

disagreed this marriage strongly due to Mei's background. John want to run away with Mei, but a lady named Emma appeared due to parents' mission. John was also attracted with this charming blue-eye noblewoman.

Horrible thing is that John's parents made Mei out of consciousness by drug, and put some men to rape Mei, then they insult Mei invited those men herself and made John believe it. Emma saw all the process of slander, but she kept quiet. Then, Mei suicides with strong hate and the weird thing happened, Mei jumped from Chinatown and her arms and legs are broken into piece. The weird thing is a beautiful Chinese lady often move at the mid-night in China town. One day, John's parents disappeared silently.

After the marriage day, Emma received a letter with blood: – “Why? Why I must die? Only because of my dark eye? and you can marry him just due to your blue eyes? You will only see the button replaced your eyes, because you saw the truth and you could say it to John, isn't it? Well if you want back your blue eyes, meet me in China town at mid night. And you will find your legs and arms are spitted like me, how about tasting my feeling?”

Can Emma avoid the attack by Mei? Can Owl help Emma prevent Mei's revenge and take back Emma's eyes? The answer is that Mei just want to trick Emma, she will threaten Emma but not hurt her.

## 4 Implementation of tracking

The red markers on the monkey are hard to capture and track, so I want to remove the unwanted color and make it to the certain color which is easy to track. I filter it used red  $\geq 150$  and blue  $\geq 60$  and so on. In this stage, I remove unnecessary color and it will track the red marker on four position of monkey like the fig below

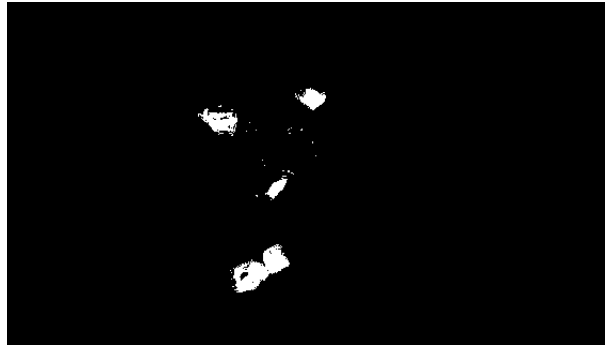


Figure 1: Filtered out pixels.

After obtaining the motion of monkey, I need to do more filter because it is still unclear, I cannot track the motion effectively, since I choose morphological operations to filter it which are Erosion and Dilation. I have taken 2 erosion

and 7 dilation to make it clear. And I used 2D array of size 5 to store the pixel under center, left, right, up and down. Then, the frame with white color tracker will be generated.

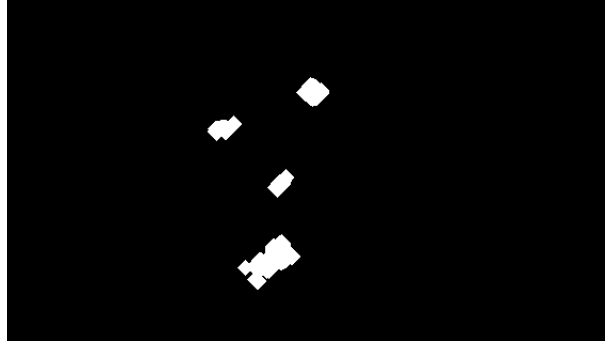


Figure 2: Enhancement segement.

Besides, I choose the 4 corners of the monkey which is min and max point for x and y separately, for centered coordinator, I just need  $\text{maxX} + \text{minY}/2$ . Since I only need 5 points per frame which will be stored in ArrayList of type PVector. the below output from println demonstrates the edge point is stored in the arraylist.

```
{ [ 138.0, 184.0, 0.0 ], [ 281.0, 82.0, 0.0 ], [ 179.0, 256.0, 0.0 ], [ 257.0, 236.0, 0.0 ], [ 209.0, 167.0, 0.0 ] }
```

Figure 3: Output.

## 5 Objects

I replace Emma from monkey, this is done by reading the frame of the background. For replacing the monkey it is also trivial the each position of body. So Emma's leg and arm will move like monkey. The reason her splitted legs and arms is because Mei trick her and split that in a short run.

The appearances of slide characters are known as Mei, a lady and owl, a bird. They will show up randomly, but Mei will only move in a line because she is phantom lady which means from left to right or right to left only. Owl can fly to each side, so it will appear from each side like top-left or bottom-right which means with any direction.

The event will be:

- The owl touches Mei, there will be a sound like bird, and it change to another form with white circle and Mei will be disappeared because it

constraints Mei's shadow in the circle cage. That is done by collusion determination of x coordinator,

- If Mei touch Emma and Mei will shock Emma with white dress and blooded knives and make a sound, then disappear. That's because Mei don't hate Emma even she is angry about her silent so Mei just want to tick Emma.



Figure 4: Emma in the demo.