COMP3419 Assignment 1

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October 2018

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1 Introduction

The task of this assignment was to program a short video involving digital video processing, compositing and 2D animation techniques. The output is a piece of animation based on the provided clip. The programming language used to complete this assignment was python3 on the windows operating system.

2 Implementation

The red parts of the monkey were found by first converting the frames to HSV (Hue Saturation Value) and then applying a threshold. The use of HSV to threshold the red parts of the monkey proved to be far superior to using RGB.

2.1 Algorithm

The K-Medoids algorithm was used to discern the the red dots into proper clusters to identify each part of the monkey. Those parts being the head, two arms and two legs. The initial centers of the clusters were manually set to be as close to the middle of each of the monkey parts as possible.

2.2 Experimental Results

In trying to find the red dots on the monkey, various morphological techniques were used. Performing a closing operating resulted in the "clusters" that had very low dissimilarity.

An opening operation yielded a result where the 5 red markers were more easy to discern and very dissimilar to each other.

Various other operations such as alternating between erosion and dilation operations with different number of itereations were performed. Eroding for more than 2 iterations before performing a dilation resulted in too few red pixels being retained. If dilating was performed first, the red dots joined too close to each other. This resulted in poorer cluster centers.

Various structuring elements were used when experimenting with the morophological operations. A square structuring element was found to...

3 Conclusion

The implementation of k-medoids was very susceptible to noise. Fast movements would often results in the clusters being messed up.