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ISC 4223 K-Means Watermarking Lab Report

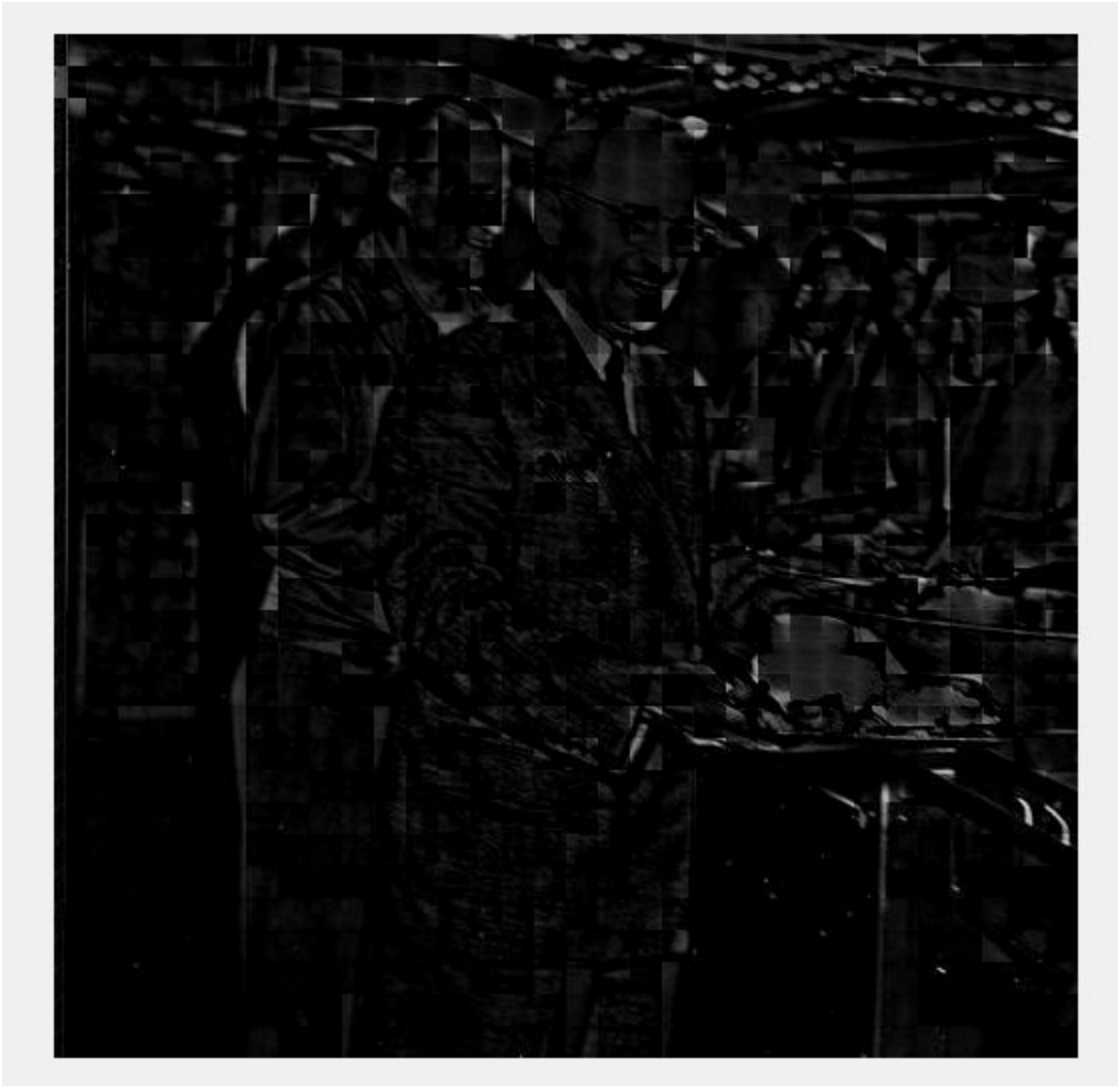
A brief description of how I implemented the project

In this project, we used K-means clustering to embed watermarks into an image. We used K-means because it is robust under image manipulations. I implemented K-means by using a function that splits the image into blocks, initializes random centers, and performs K-means by finding the distance between each center and each block, finding the average of the clusters, and reassigning until the the distance between clusters did not change by a threshold of 1e-6. We then perform matrix manipulations to embed the watermark into the image. The results obtained can be seen in the below figures, mainly the extracted watermark. The accuracy of my result can be improved by doing the additional steps (13-17) in the lab.

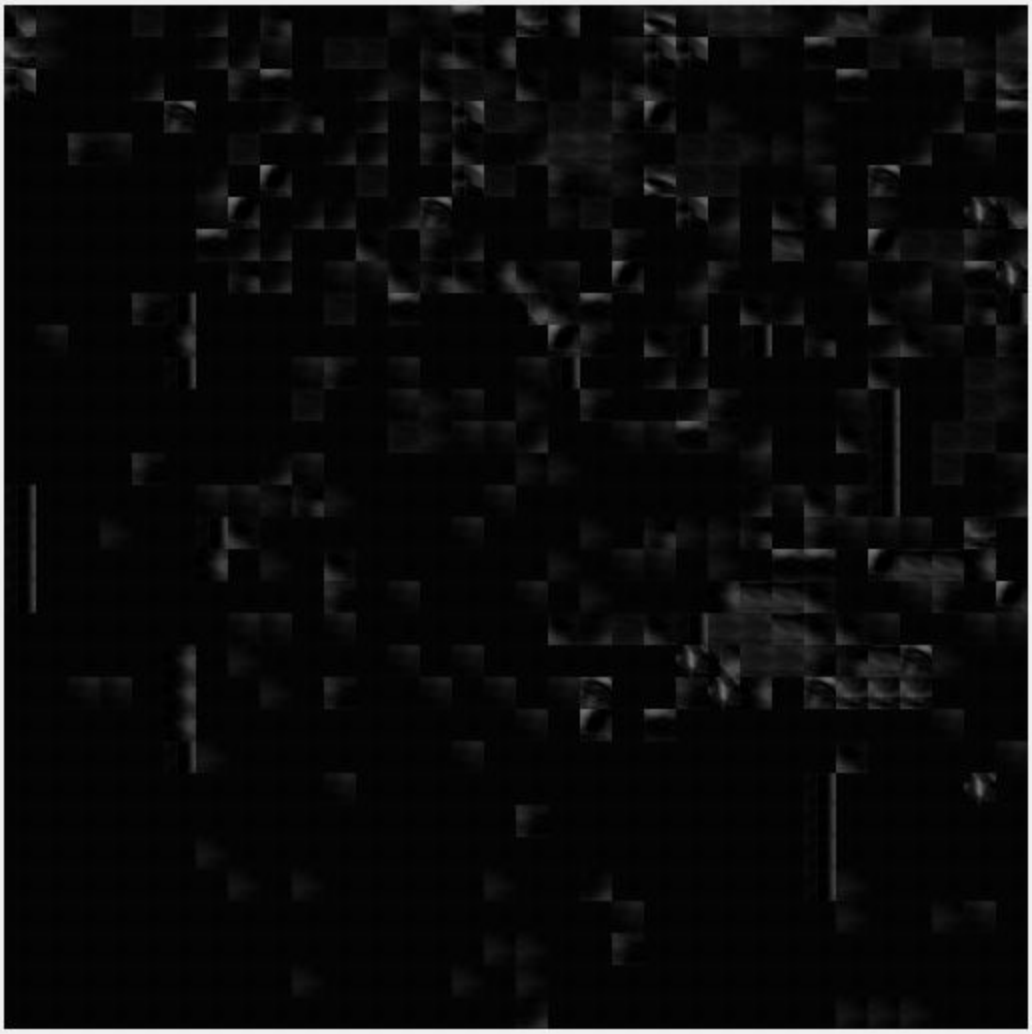
Figures

Step 3: Approximate Image

Step 4: Difference Image



Step 4: Difference image after K-Means



Step 5: Improved image

Step 12: Extracted watermark