

Image Compression And Head Count

Group 6

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Work Flow

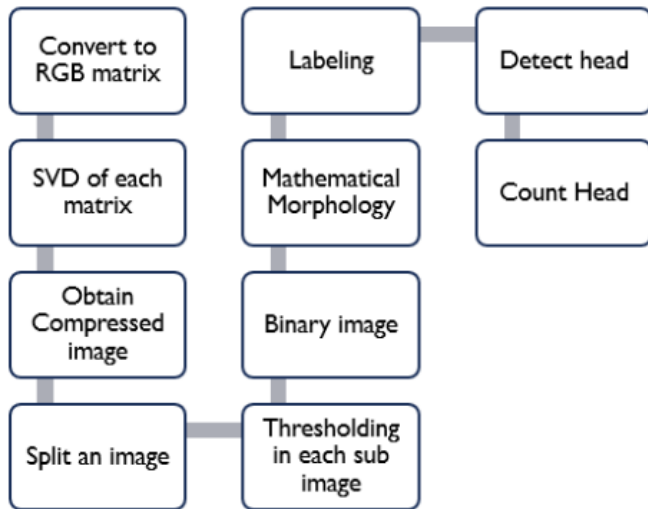


Image Compression

- 1 As shown in work flow first we convert an image into matrix form(RGB matrix)
- 2 Decompose each R G and B matrix in to USV^T .
- 3 Then we take first 100 singular value from S matrix and make other value zero.
- 4 Then multiply new USV^T to get new R G and B matrix.
- 5 Here, U matrix is unitary matrix. Where $u_i = AV_i/\sigma_i$
- 6 S matrix contain singular values of $A^T A$. Singular value is squar root of an eigen value.
- 7 Here, V matrix contain orthonormal eigen vector of $A^T A$. Where A is original matrix of an image.

Pre Processing Techniques

① Segmentation

- Here, we divide an image into four parts and apply separate threshold value to each part. Using threshold value we convert gray level image into binary image.

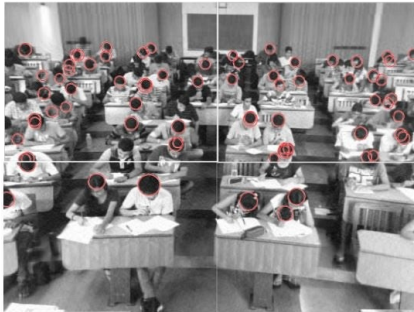
② Mathematical Morphology

- ① Dilation:- The basic effect of operator on a binary image is to gradually enlarge the boundaries of regions of foreground pixels. Thus the area of foreground pixels grows in size while holes within those regions become smaller.
- ② Erosion:- The basic effect of operator on a binary image is to erode away the boundaries of regions of foreground pixels shrink in size, and holes within those areas become larger.

Head Count

- ➊ After all preprocessing, image contained black head and some noise in each sub image.
- ➋ Now the task is to detect head and count them.
- ➌ So, we find the radius of the head and made a disk of that radius. And apply that disk on each sub image. Here, range of radius in each sub image is different.
- ➍ When the dark part fit into that disk we label them. And merge them.
- ➎ And last we count that labeled head.

Results



Head Count

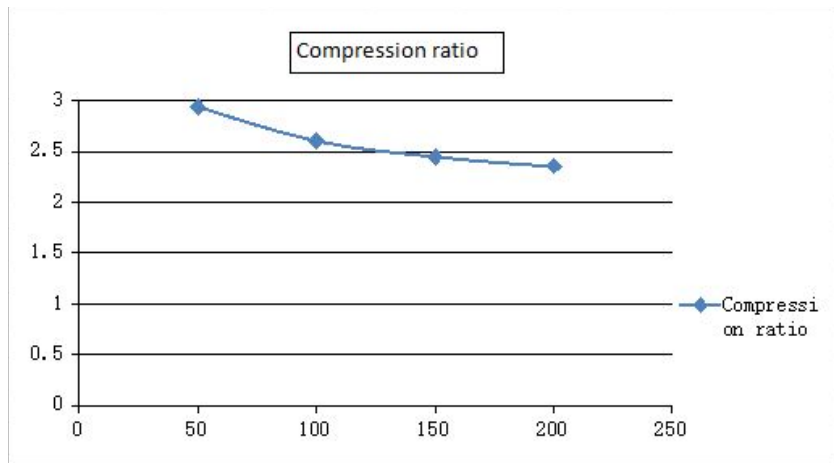


Compressed Image

Original Size: 1935 KB
After Compression: 744 KB
No of Students in image: 78
Object Detected: 72
Correct Head: 56

Compression Ratio: 2.60
Head Count accuracy:
77.77%

Compression Ratio



Future Work

- 1 **Attendance System:**We are planning to make thus application in which we can take an attendance by click an image of classroom.In this application, photos of all studends would be stored in database.By scanning the photo of classroom and compering each face with database we can get an attendance of each student.
- 2 **Real time face detection:**With the help of Open CV we would like to implement this project for real time face detection which would also need us to improve the Accuracy of the project.