Computer Vision, A.Y. 2017/2018
Master Degree in Computer Engineering
Master Degree in ICT for Internet and Multimedia

# Homework 1 – LAB 3
Deadline: April 23, 2018

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Lab session #3 is about the Image Equalization, Histograms and Filters,This is divided into 3 parts.

Part 1 is about accepting/Loading an image and displaying its respective channels histograms.

- Here we just loaded the image with "imread"command which is split into their respective planes using SPLIT command by creating an array bgr_planes.

- Then we assigned the bin sizes and used CalcHist function to calculate the histograms by giving the arguments as specified in the documentation for the function.

- Once the histogram is calculated , we normalised using NORMALIZE function so that it fits into the ranges that we specified.

- Then,Finally, we create the histogram by iterating it in a loop till the entire histogram is formed on a window.

- **These are the respective histograms of R,G,B planes**
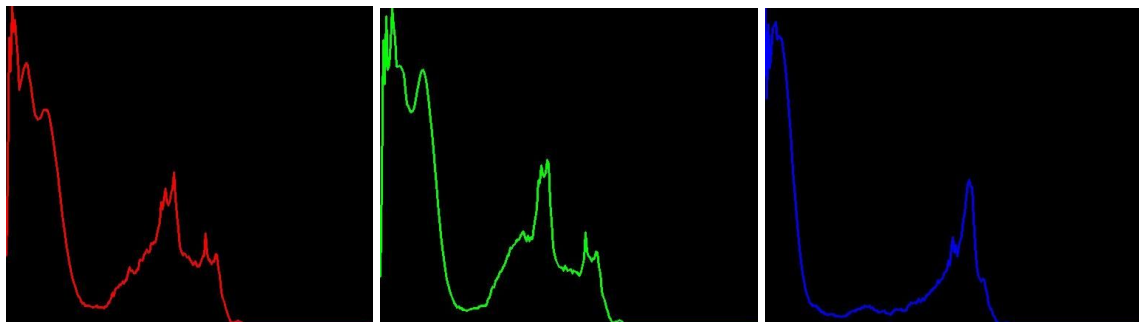
- **Part 2** is about equalizing the channels and displaying their histograms.

- In the first phase the image is loaded , split into its planes exactly as above part.

- The major difference here is,we used EQUILIZEHIST function to equalize each plane, this function takes an array ,equalizes it and stores in the destination field.

- Later we use calchist and normalize functions to calculate and normalise the histograms and windows respectively and display the histograms.

- **These are the respective equalized histograms of R,G,B planes.**
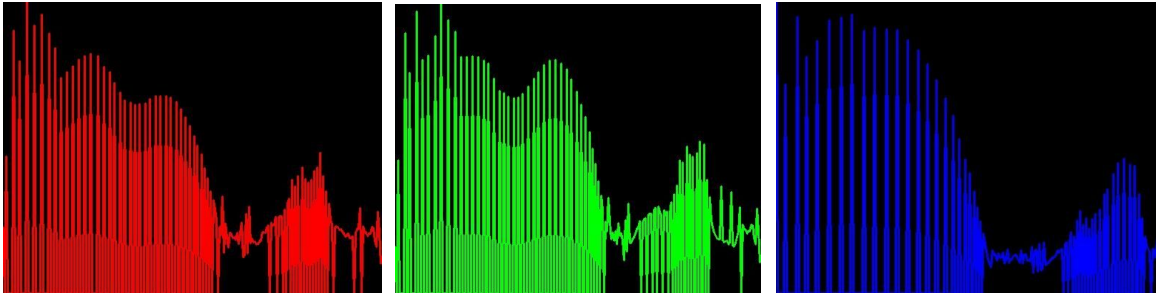
- **Part 3** is about choosing an even better equalizing using a different color space.

  - We again used the basic imread function to load images and converted the image from RGB2LAB using CVTCOLOR function.

  - We then created an array to store the image planes and used CLAHE algorithm.

  - Later,the CLAHE algorithm is applied only on the L-Channel as the image lacked the luminosity/lightness and after applying it we observed only this is the better option to choose.

  - Here,When the CLAHE is applied it is stored in an different array which is later copied back to its plane.All the planes which were split earlier are merged together using MERGE function

  - The merged Planes are later converted to RBG colorspace and the results are stored using IMWRITE function.

Source Image   **Image with equalized L-channel**