Weekly Report 1

Group Members:-

• Yash Kirti AU2340149

• Yashvi Modi AU2340116

• Priyanshu Rupala AU2340207

 • Tathya Parikh AU2340151

Week: 1 (Project initialization phase)

Project Title: Super Resolution using Classical Interpolation Methods

• Total work done

a.Understanding the Problem Description.

➤ The subject of the project that has been analyzed was called Super Resolution Problem: Extrapolate a smaller image into a larger one using classical interpolation methods and evaluate similarity.

➤ concluded that we have to use classic image processing methods only - not deep learning or machine learning.

➤ studied the three primary upscaling algorithms of picture interpolation: closest-neighbor, bilinear, and bicubic.

➤ The known evaluation metrics to compare the quality of the SR and HR image are PSNR (Peak Signal-to-Noise Ratio) and SSIM (Structural Similarity Index Measure).

b.The Process of Workflow Planning.

➤ A timeline of 10 weeks was developed to offer systematic project instructions:

➤ The first step that one takes to super-resolution (SR) reconstruction is to collect the high-resolution (HR) images and produce the identical images in low-resolution (LR) version.

➤ Interpolation Methods: To generate SR pictures, the traditional approaches such as nearest-neighbor, bilinear and bicubic interpolation are used.

➤ Performance Evaluation: We evaluate the quality of the image using PSNR(peak signal to noise ratio) and SSIM(structural similarity index measure)

➢ Visualization: Compare and explain results with the help of quantitative and visual analysis.

c. Plan for the Dataset

➢ A special dataset was generated to meet the requirements of the project:
➢ High resolution Photos: In Hr as samples, some amazing 1024 x 1024 photos of things, structures and nature were utilized.
➢ Low-Resolution Generation: The HR pictures were resized to 256x256 using the INTERAREA interpolation of OpenCV, which generated equivalent LR pictures.

d. Initialization of coding part

➢ The initial implementation step to prepare the dataset was done in Google Colab:
➢ Narrow down every High-Resolution (HR) image in the specified folder.
➢ They were automatically downsized to the correct Low-Resolution (LR) size.
➢ The generated LR dataset was stored and packed to be used further.
➢ LR-HR picture pairings were verified and displayed to ensure that the dataset was accurate.

e.Tasks to be undertaken in the next week.

➢ The process of super-resolution of LR pictures by upscaling them with various interpolation techniques is the initial stage:
➢ The closest neighbor
➢ The bilinear
➢ Bicubic
➢ In order to make a visual comparison of LR and SR photos, display them.
➢ All the SR results are to be stored to evaluate them.
➢ To help in the quantitative assessment, it is time to start practicing PSNR and SSIM evaluation codes.