ImageGenie: A Magic Wand For Images Enhancement Using Deep Learning

1 PROJECT BACKGROUND

In today's digital age, images play a crucial role in communication and self-expression. People take and share hundreds of photos every day on various social media platforms, and the demand for image enhancement tools has never been higher. According to a report by the Malaysian Communications and Multimedia Commission (MCMC) in 2021, approximately 94.8% of Malaysians own a smartphone, indicating a widespread adoption of mobile devices. Among the activities of smartphone users, 74.8% use smartphones to take photos or videos. Therefore, there is a need for an application that combines multiple image enhancement tasks in a single, user-friendly platform. This is where ImageGenie comes in. ImageGenie aims to provide users with a unified solution for enhancing image resolution and applying artistic styles to their images.

2 PROBLEM STATEMENT

Low-quality images are a common problem that many people encounter, particularly when taking pictures with their mobile phones. The lack of image quality can result in images that are blurry, pixelated, or have poor resolution. These low-quality images can be frustrating for users who want to share their images on social media platforms or use them for personal or professional purposes. According to a survey conducted by Ipsos in Malaysia (2021), approximately 65% of social media users express dissatisfaction with the quality of images they encounter online.

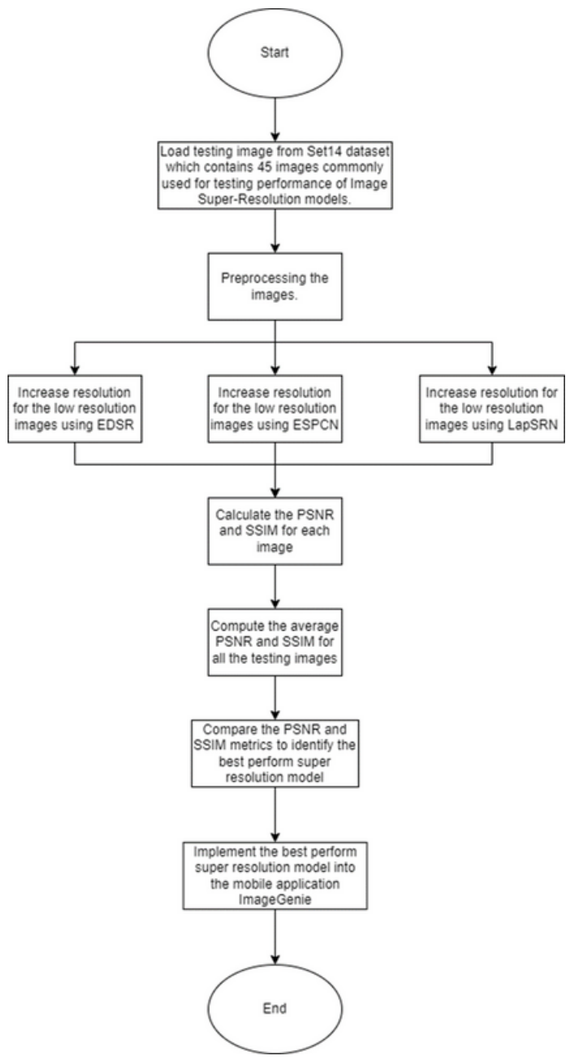
With the increasing popularity of social media platforms, people will shareimages that they think are attractive or interesting to social media. Moreover, many individuals appreciate the beauty of visually captivating artwork, artistic images have the power to evoke emotions, spark creativity, and inspire others. However, for individuals that are lacking the advanced drawing skills, creating such artistic artwork can be quite challenging.

3 OBJECTIVE

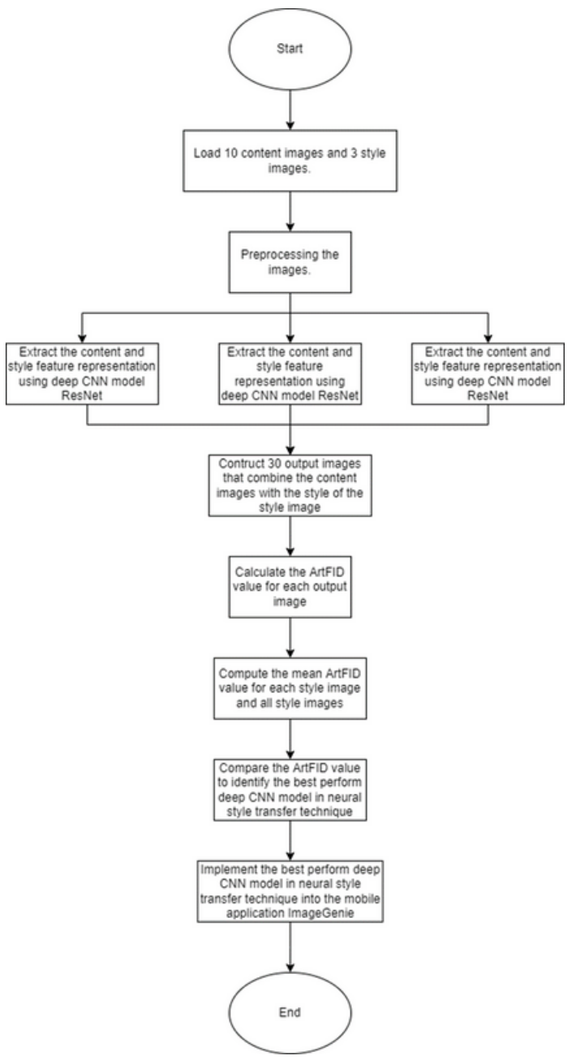
1.To increase the resolution of low quality images using EDSR.

2.To allow users to perform neural style transfer that can compose one super resolved image in the style of another image using VGG19.

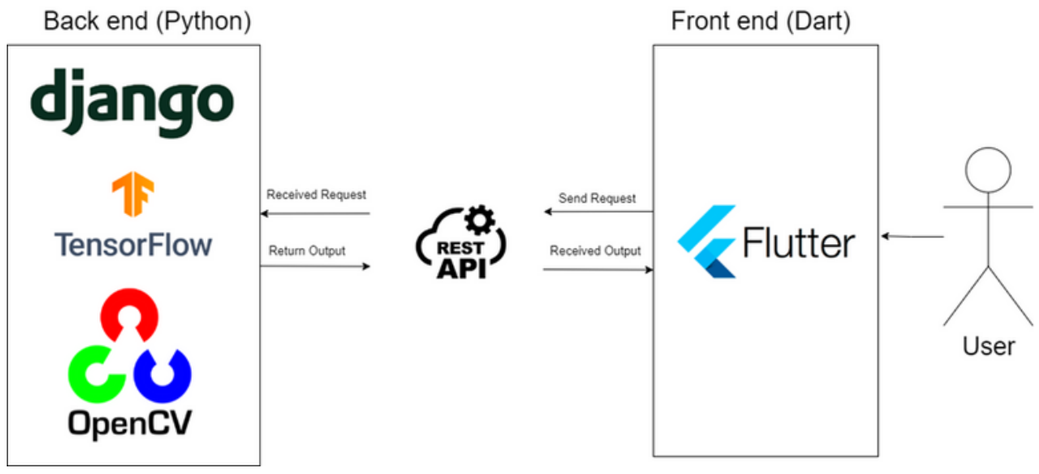
4 METHODOLOGY



Flowchart for the Super Resolution Models Performance Comparison

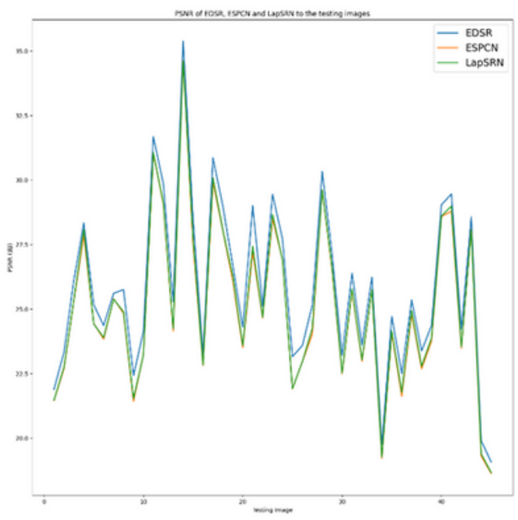


Flowchart for the deep CNN Models in Neural Style Transfer Performance Comparison

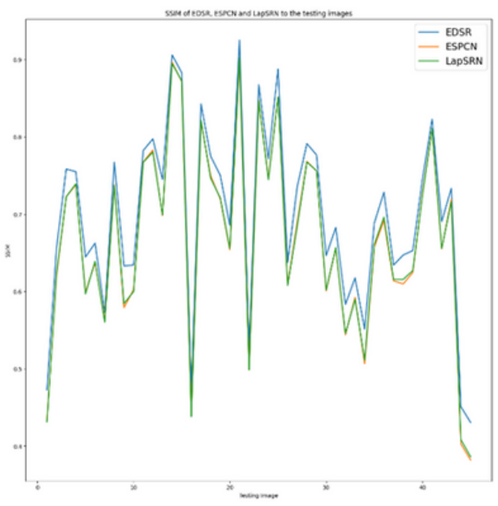


The system architecture of the ImageGenie application

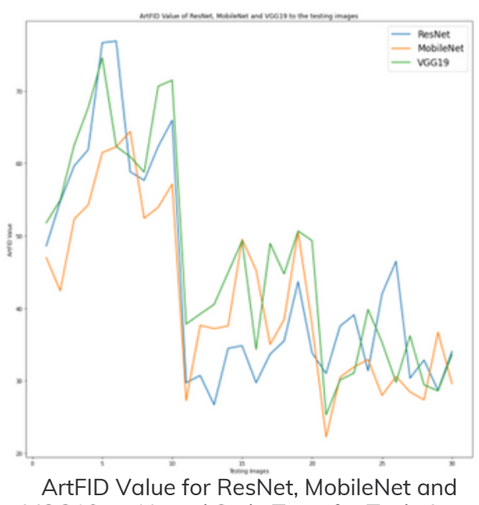
5 RESULTS



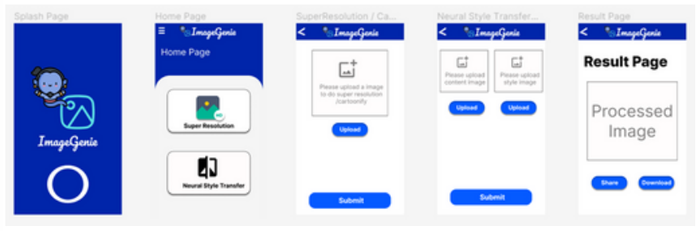
PSNR of EDSR, ESPCN and LapSRN to the testing images



SSIM of EDSR, ESPCN and LapSRN to the testing images



ArtFID Value for ResNet, MobileNet and VGG19 on Neural Style Transfer Technique Tested on 30 Images



User Interface of ImageGenie Application