

## ABSTRACT

*Computing technology improvement on computer in the competitive era is increasingly encouraging breakthroughs from various fields of science and implementation. The use of deep learning technique becomes one of areas getting attention. It owns concern in an area as solving problem on computer vision related to the digital image processing using images and videos. The integration of digital images as input, digital signal processing, and computer vision with the help of deep learning as a system results a potential openness in the development of output scope, image quality improvement or super resolution.*

*Super-resolution is an image quality improvement technique based on the process of recovering high-resolution images or videos from low-resolution and compressed. Super-resolution image needs affect several applications depending on the images. such as high-definition television, surveillance devices, medical and satellite image and facial recognition. Super-resolution image generation process supported by the development of convolutional neural network method strengthens the potential which is directly proportional to the absence of implementation variations of the scope. The use of Google Collaboratory open-source application supported by a popular programming language will make it easier to use namely Python In addition the use of sub-pixel convolutional neural network parameter will be the basis for this final research.*

*The realization of image improvement implemented using a deep learning framework is the expected output in this final project. It is based on the several researches which have been published previously. This study obtains PSNR and SSIM results for the default Sub-Pixel Convolutional Neural Network, which is to get an average scale of 3 of 33.8913 dB and the average value of a scale of 5 of 33,72911 dB. In SSIM the average value for scale 3 is 0.929311, and the average value obtained on scale 5 is 0.901258, for Sub-Pixel Convolutional Neural Network modified for scale 3 is 34.13394 dB and the average value for scale 5 is 33,27373 dB . In SSIM, the average value for scale 3 is 0.93253, and the average value obtained on scale 5 is 0.894935, for epochs it is compared directly with the default Sub-Pixel Convolutional Neural Network and Sub-Pixel Convolutional Neural Network modified, Sub-Pixel The default Convolutional Neural Network gets an average PSNR of 29,556 dB and the modified Sub-Pixel Convolutional Neural Network gets an average value of 30.4642 dB*

**Keywords:** *Deep Learning. Image Quality Improvement. Digital Image Process. Sub-Pixel Convolutional Neural Network. Image Quality Improvement Technique*