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INTRODUCTION

Low resolution image which has a small number of pixels, that making it difficult to recognize the details of the image . The Super-resolution Contributes to the production of high quality images .

WHAT IS SUPER-RESOLUTION?

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WHAT IS SUPER-RESOLUTION?

It is image processing which is refer to techniques that improve and increase image quality.

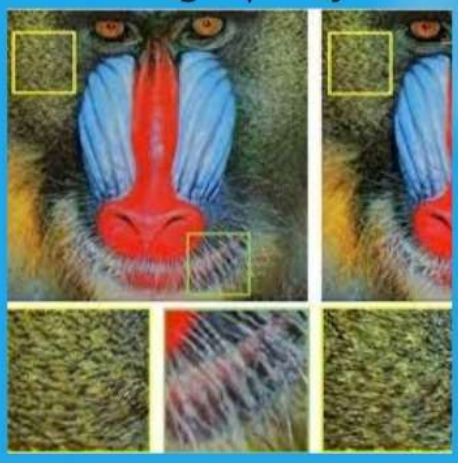

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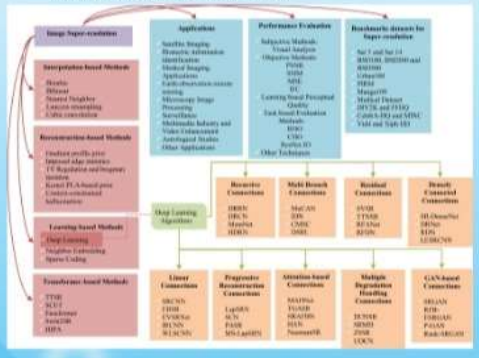
IMAGE SUPER - RESOLUTION METHODS

- Interpolation -based Methods
- Reconstruciton -based Methods
- Learining-based Methods
- Transformer-based Methods



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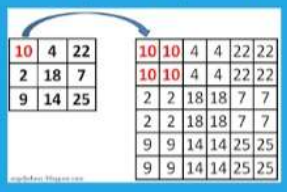
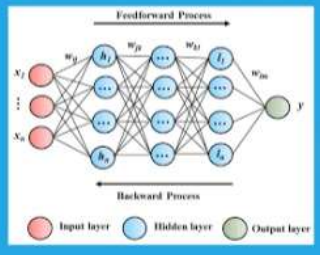
Interpolation Method. Interpolation is the process of using points with known values or sample points to estimate values at other unknown points.The example for interpolation in bicubic interpolation



10	4	22
2	18	7
9	14	25

10	10	4	4	22	22
10	10	4	4	22	22
2	2	18	18	7	7
2	2	18	18	7	7
9	9	14	14	25	25
9	9	14	14	25	25

Learning-based Method. achieves its objective. The three major types in example or learning based super resolution techniques are Deep learning neighbor embedding , sparse coding



SRCNN

VDSR

TYPES OF SUPER-RESOLUTION ALGORITHMS:

- Super-Resolution Convolutional Neural Network (SRCNN)
- . Fast Super-Resolution Convolutional Neural Network (FSRCNN)
- Multi-Connected Convolutional Network for Super-Resolution (MCSR)
- Very Deep Super Resolution (VDSR)

https://www.mdpi.com/2079-9292/10/7/867#B27-electronics-10-00867

FSRCNN

MCSR

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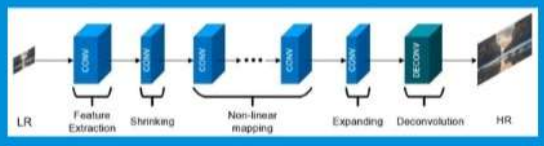
FAST SUPER-RESOLUTION CONVOLUTIONAL NEURAL NETWORK (FSRCNN)

The five major parts:

- extraction,
- shrinking,
- non-linear mapping,
- expanding,
- image reconstruction.



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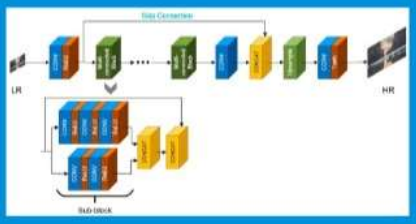
Multi-Connected Convolutional Network for Super-Resolution (MCSR)

Instead of using a single path network multi-connected block (MCB) that used a multi-path network.



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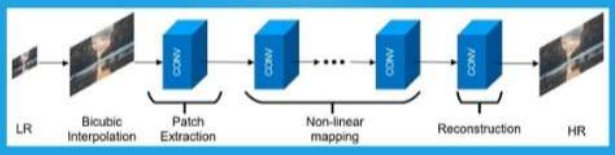
Convolutional Neural Network (SRCNN)

The idea of SRCNN was inspired by sparse coding-based super-resolution methods.
The main parts:



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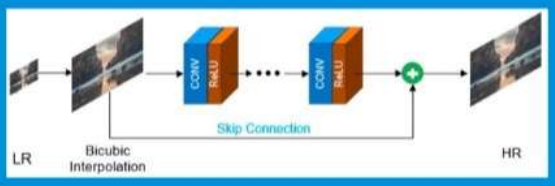
Very Deep Super Resolution (VDSR)

Overcome the problem of requiring more mapping layers to get better model performance in SRCNN. VDSR skip connection learning between the input and output



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APPLICATIONS OF SUPER RESOLUTION

1- Medical Imaging:
Super-resolution techniques are widely used in medical imaging to improve the resolution and quality of medical images, such as X-rays.
2-Satellite Imaging:
Satellite imaging often involves capturing images of the Earth's surface from space, and super-resolution techniques can significantly enhance the spatial resolution of these images.

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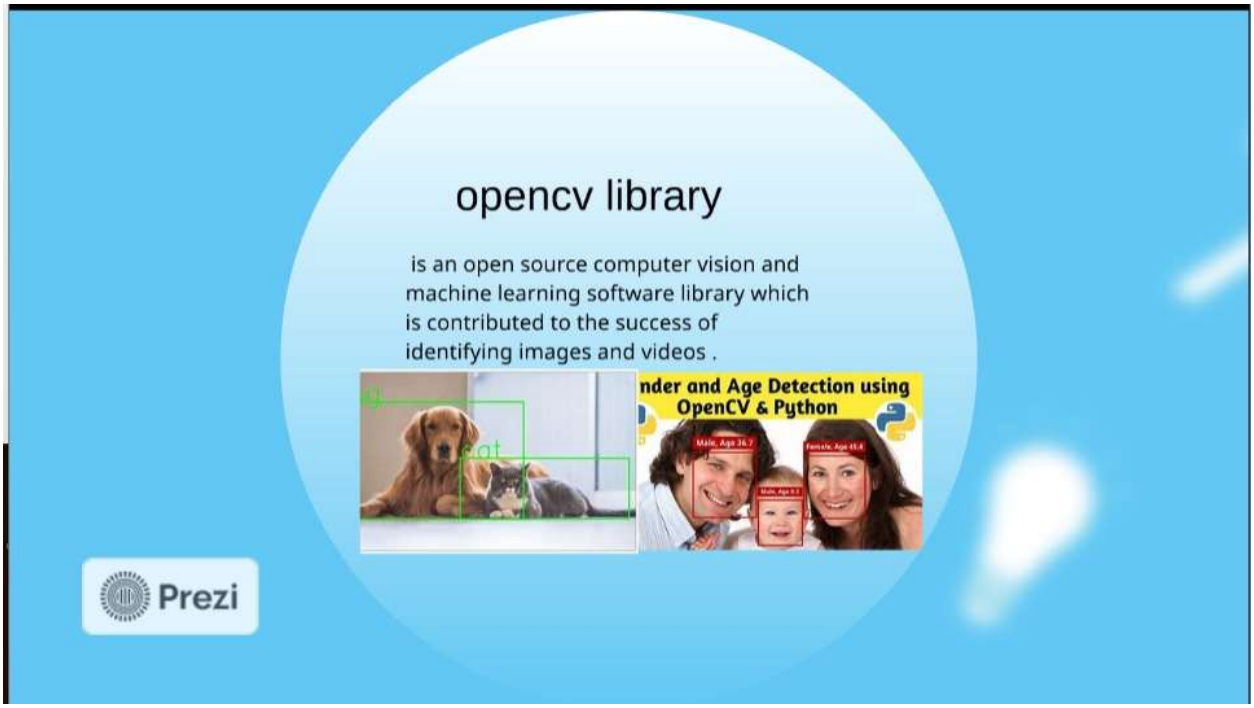

Dataset

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Dell\Desktop\image processing> python .\changeImage.py
<PIL.JpegImagePlugin.JpegImageFile image mode=RGB size=492x757 at 0x12932227220>
492 757
<PIL.JpegImagePlugin.JpegImageFile image mode=RGB size=284x177 at 0x1293423AD40>
284 177
PS C:\Users\Dell\Desktop\image processing>
```
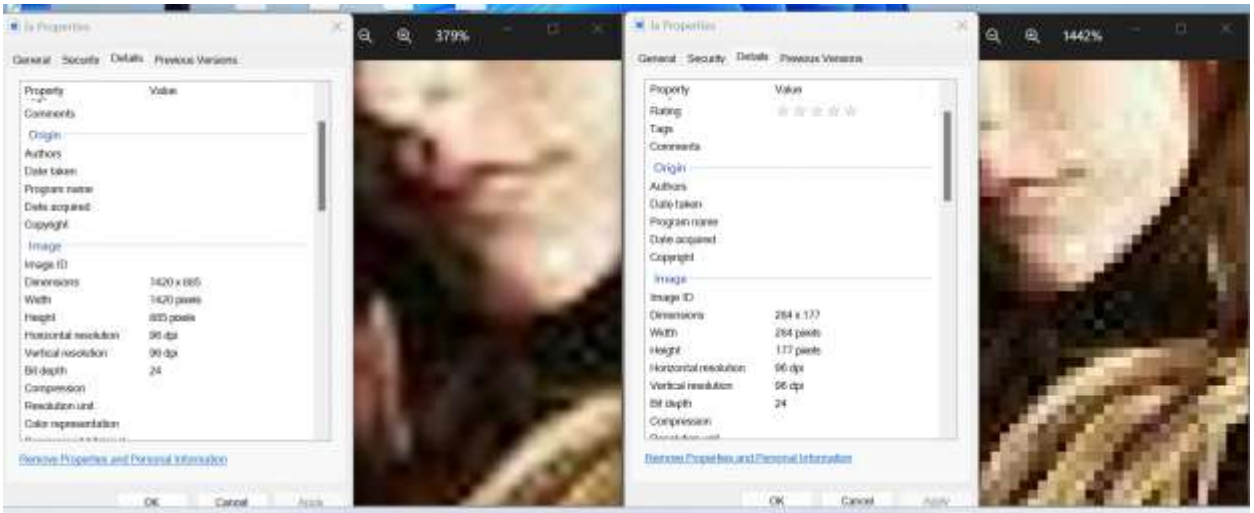

results



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