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A Review on Introduction of Image Processing and their Application

Sachhidanand
Asst .Professor,
Dept. of Computer Science,
Govt. First Grade College, Aurad(B),
Dist. Bidar. Karnataka. India
Email id: sachhi.r@gmail.com

Kavita Manikrao
Bidar-585401
Karnataka State
Email id : kavi_sachhi@yahoo.co.in

Abstract: Image processing is the form of signal processing in which we give the image as the input and we get the processed image as the output. In this paper we will study about the different types of image processing and its application. Image processing is completely depends on a pixels of an image. To understand image processing we need to understand pixels firstly then we will differentiate image processing into parts.

Keyword: *Image processing, Analog Image processing, Digital image processing.*

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I. Introduction:

Image processing is the form of signal processing where signal is considered as a image. We know that the image is made by number of pixels these numbers of pixels contain a some values. These values define the intensity and property of the image. So pixel is the very important parameter in image processing.

In image processing we take any image as a input which we want to process then the output of the image processing is also an image but the difference between input and output image are given below in points.

- Size of output image is less than the input image.
- Noise in output is totally removed by the pre processers.
- Output image is converted into digital image that mean each output image pixels assigns a binary value 1 and 0.
- Input image is bigger and larger than the output image.

These are the important points which works to process of image in image processing.

Digital Image: A digital image is the representation of the 2 dimensional image as a finite set of digital values, this values are assigned where is known as a pixel.

Pixel values typically represent gray levels, colours, heights, opacities etc Remember digitization implies that a digital image is an approximation of a real scene

In computer vision, the image processing can be broken into low- middle and high-level process.

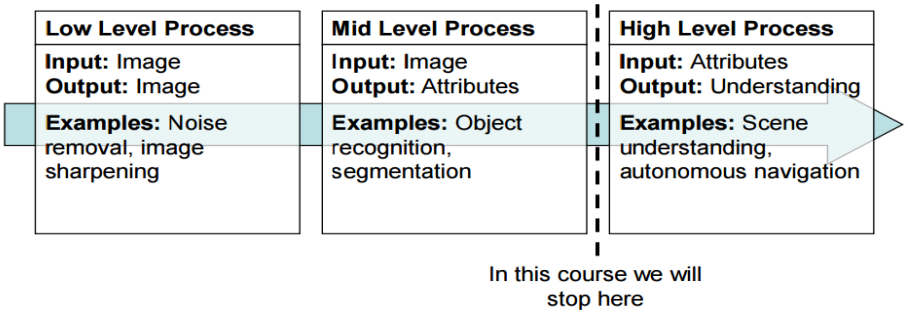

Fig.1 Processes of Image processing

II. Purpose of Image processing

Image processing is covered and defined into 5 Groups

1. **Visualization** – To visualize and observe the objects that are not visible.
2. **Pre processing with Image sharpening and restoration** - To remove an noise from an image and make image better by removing streaks, line etc.
3. **Segmentation of Image** – Here image is segmented to detect our ROI (Region of Interest).

4. **Pattern Recognition** – Measures various objects and patterns in an image.
5. **Image Recognition** – Final output and Define the objects in an image.

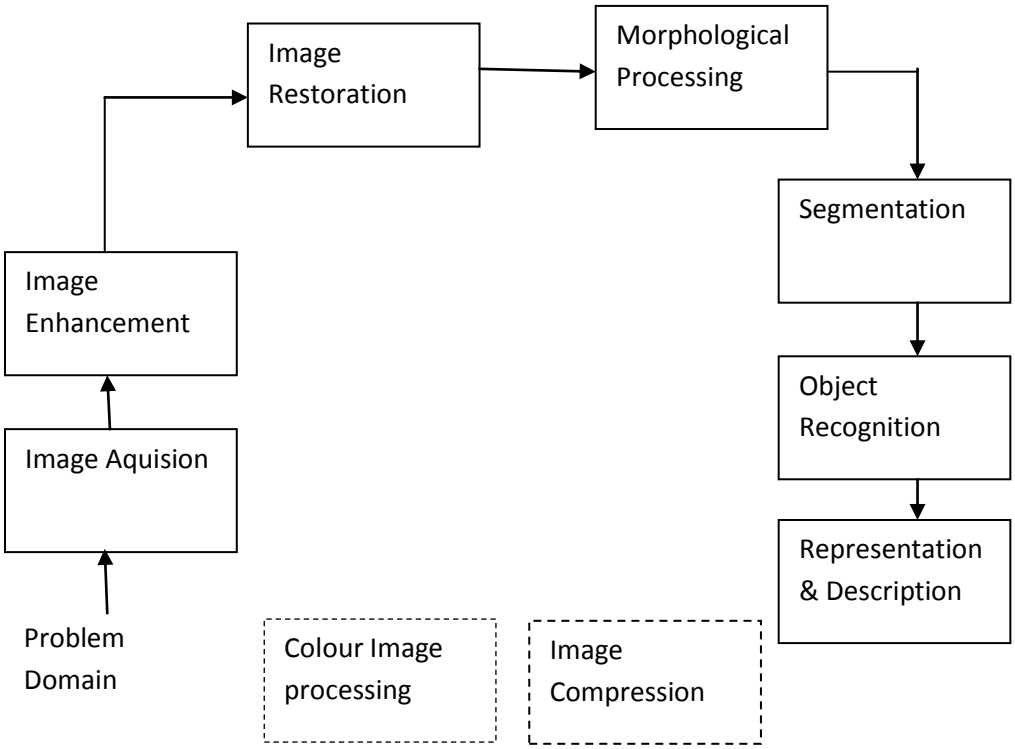

Fig.2 Working procedure of Image processing

III. Types of Image Processing

Image processing is defined and classified into three types which are given below:

1. **Analog Image Processing**
2. **Digital Image processing**

1. Analog Image processing:

Analog image processing is also known as visual techniques of image processing and it may be like a print outs, hard copies of images, photographs etc. Image analysts use different fundamental methods of interpretation of images by using these visual techniques or analog image processing.

So analysts apply a combination of personal knowledge and collateral data to image processing.[1]

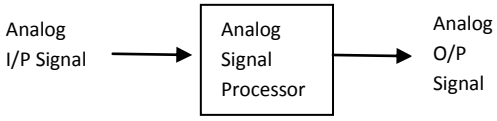

Fig.3 Analog Signal Processor

2. Digital Image processing:

Digital image processing is the second type of image processing which is used by a computers laptops, palmtops and smart phone to manipulation of an image.

Normally Digital Image Processing system consider a image as a two dimensional signals while applying already set signal processing methods to them.

DIP (Digital image processing) is among rapidly growing technologies today, with its applications in various aspects of a business. Image Processing has a vast core research area in research and engineering field. As raw data is taken by image sensors from satellite camera, DSLR camera, SLR Camera, MRI Machines etc, and some platform contains deficiencies. To get a useful information from these photos in originality images has to undergo various phases and steps of processing. The three general phases that all types of data have to undergo while using digital technique are Pre- processing, enhancement and display, information extraction. In Fig 4 block diagram of digital image processing is shown.

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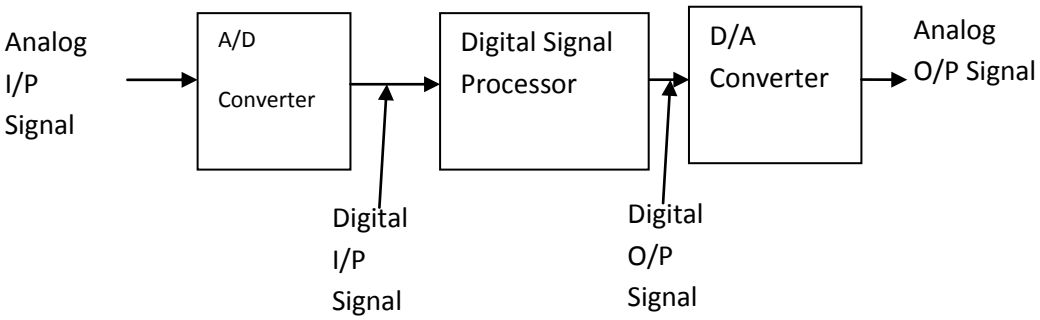

Fig.4 Block Diagram of a Digital Signal Processing System.

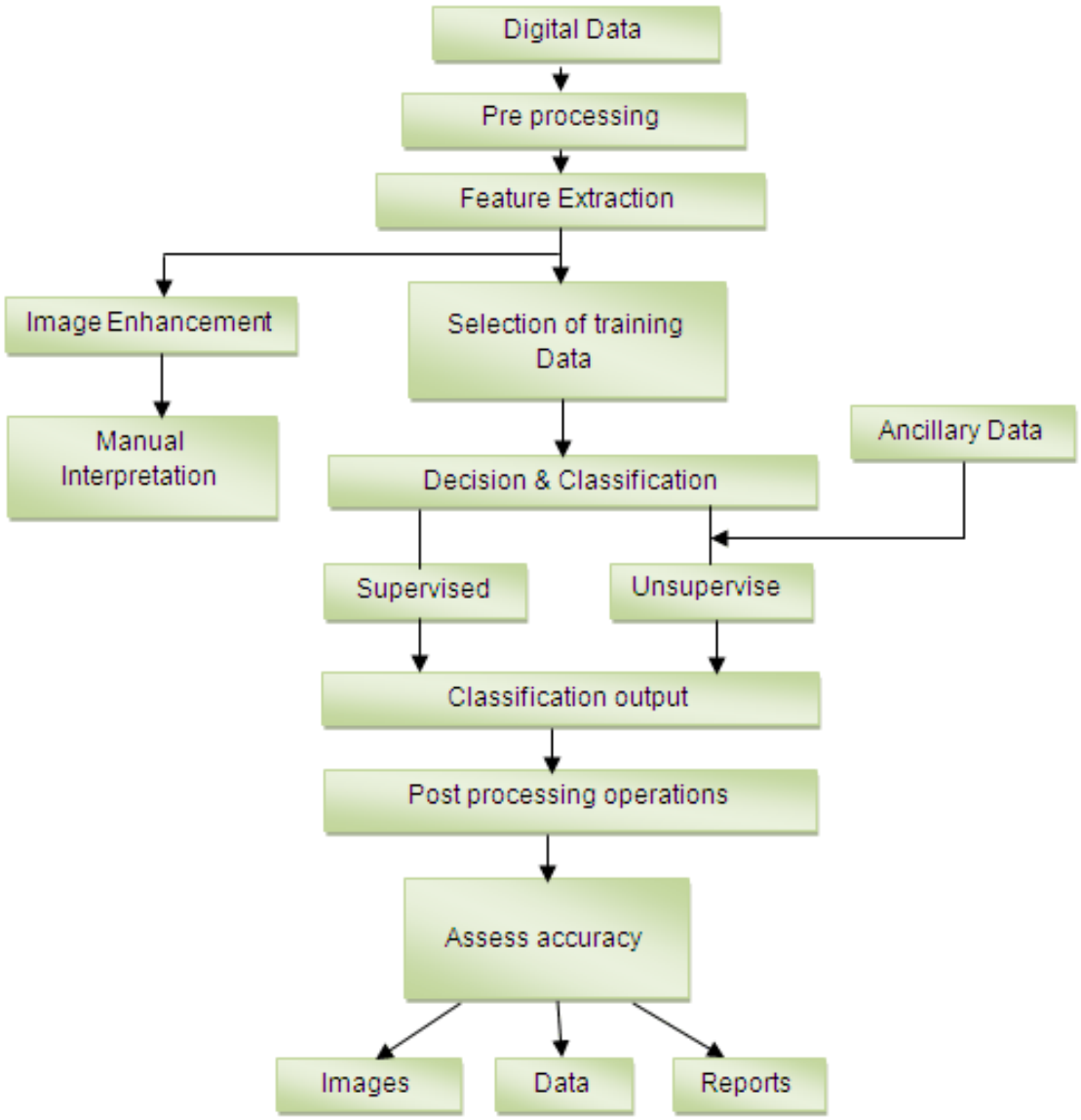

Fig 5: Algorithm of Digital Image Processing

IV. Applications of Digital Image Processing

Image Processing is used in various applications areas which are given below:

Law Enforcement:
Image processing techniques are used extensively by law enforcers – Number plate recognition for speed cameras/automated toll systems – Fingerprint recognition –

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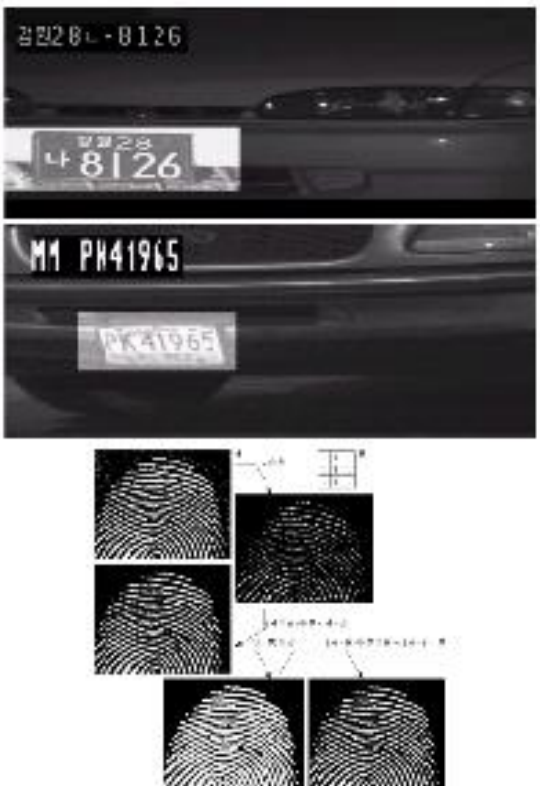
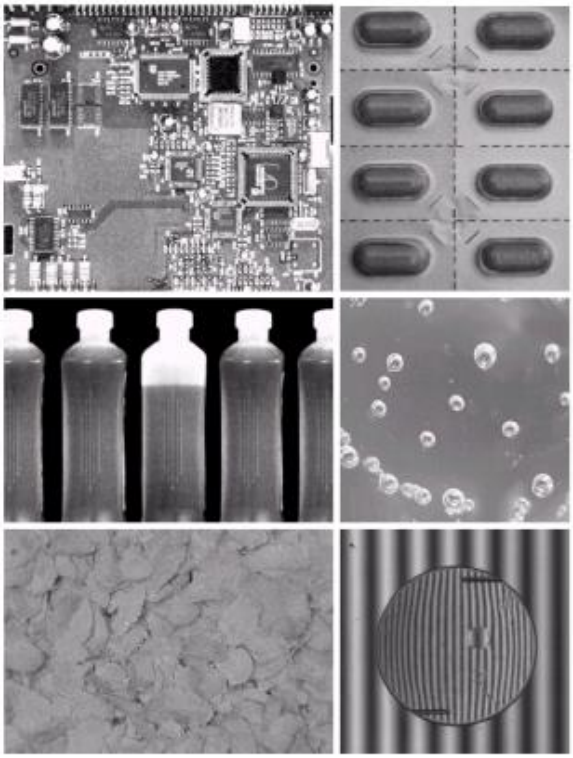
Enhancement of Images taken from Gonzalez & Woods, Digital Image Processing (2002) CCTV images.



Industrial Work:
Human operators are expensive, slow and unreliable. Make machines do the job instead industrial vision systems are used in all kinds of industries.



Many more applications:

- Satellites
- Forensic Studies
- Printing Industry
- Medical Imaging
- Non-destructive Evaluation
- Remote Sensing
- Military
- Document processing
- Material Science.
- Textiles
- Film industry
- Graphic arts

V. Conclusion

Image processing is the form of signal processing in which we give the image as the input and we get the processed image as the output. In this paper we will study about the different types of image processing and its application. We have seen image processing is covered by every field and that's why researchers are continuously doing work to make better results.

VI. References:

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