

# **AI in Image Processing**

*A Project Report Submitted  
in Partial Fulfillment of the Requirements  
for the Degree of*

**Bachelor of Technology**

*by*

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# CERTIFICATE

*This is to certify that the work contained in this thesis entitled “**AI in Image Processing**” is a bonafide work of **Kaushal Kishore (Roll No. 111601008)**, carried out in the Department of Computer Science and Engineering, Indian Institute of Technology Palakkad under my supervision and that it has not been submitted elsewhere for a degree.*

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# Acknowledgements

Write acknowledgements, if your want to.

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# Chapter 1

## Introduction

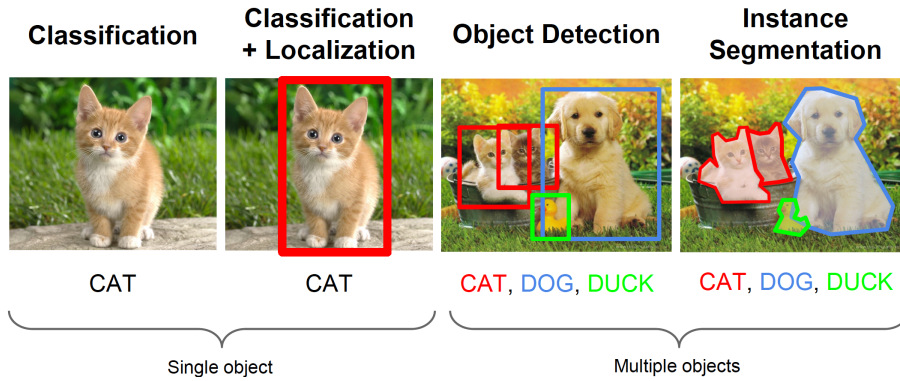
Image processing libraries these days (eg. Open CV) uses the conventional methods which have the possibility to be outperformed by methods which leverage the power of artificial intelligence. Some recent research have shown that some of these AI based methods are able to perform atleast as good as conventional approaches. The aim of this project is to implement, apply and possibly improve upon the existing approaches in Digital Image Processing and Computer Vision. These common tasks can include (not limited to) applications like: Image Compression, Denoising, Super Resolution, Flow Estimation, Object Detection, etc.

### 1.1 Image Processing

Image processing is manipulating an image in order to enhance it or extract information from it. It is widely used in medical visualization, biometrics, self-driving vehicles, gaming, surveillance, and law enforcement. It can used in various ways: visualization, restoration, information retrieval, pattern recognition, etc.

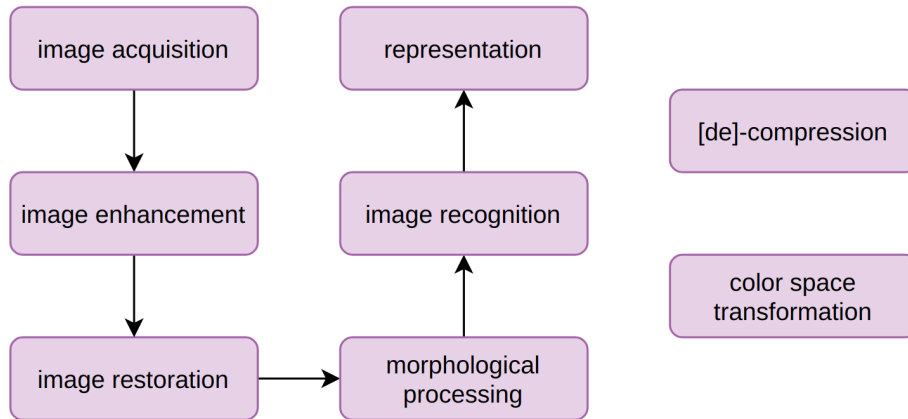
General approach of image processing involves eight key phases: image acquisition, image enhancement, image restoration, color space transformation, compression or decom-





**Fig. 1.1** Examples of pattern recognition  
**Source:** [www.cs.cornell.edu](http://www.cs.cornell.edu)

pression, morphological processing, recognition, and representation. It is very difficult to carry out these steps manually on a very big data, this is where AI and ML algorithms become very helpful.



**Fig. 1.2** Key phases of image processing

## 1.2 Recent advances

Modern AI algorithms have enabled computer to perform detection, segmentation, recognition, compression, extraction, generation, and discrimination. Every year a state of the art model is invented to solve the existing problem in a better way. It is now an established fact that machines are now better than humans in counting, classifying and segmenting instances.

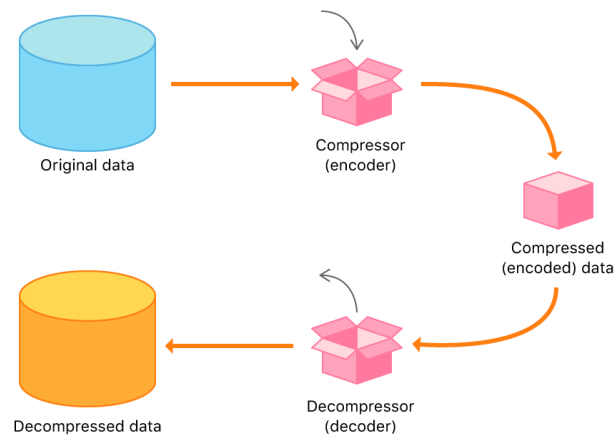
## 1.3 Organization of The Report



# Chapter 2

## Image Compression

A data compression algorithm transforms the data to occupy a less space. The original data is encoded by a program called encoder, to a compressed representation using a fewer number of bits. Decoder is responsible for decompressing the compressed representation. The compression technique where the decompressed data is exactly same as original data is called as lossless compression otherwise it is known as lossy compression technique because some information is lost during coding-encoding phase.



**Fig. 2.1** Compression phases

**Source:** <https://developer.apple.com/documentation/compression>

Two well-known codecs for image compression are JPEG and PNG. PNG is lossless and JPEG is lossy.

Image compression is very crucial in order to reduce the size of disk space used as well as reduce the amount of internet bandwidth used while loading images. It's also important to compress images for people accessing the internet via low bandwidth connections.

## **2.1 Section name**

write ....

## **2.2 Conclusion**

This chapter provided details of the some of the existing distributed algorithms for constructing a CDS in wireless ad-hoc networks. The results of these evaluations are summarized in table cut from here. In next chapter, we discuss our distributed Algorithm I, for constructing a small backbone in ad-hoc wireless network.

# Chapter 3

## Algorithm I

give details of your algorithm

### 3.1 Conclusion

In this chapter, we proposed a distributed algorithm for construction of xyz. The complexity of this algorithm is  $O(n \log n)$ . Next chapter presents another distributed algorithm which has linear time complexity based on xyz.



# Chapter 4

## Algorithm II

The algorithm presented in previous chapter has  $O(n)$  time complexity. We further propose another distributed algorithm in this chapter based on xyz which has linear time complexity.

### 4.1 Construction

Write ...

### 4.2 Improved Method

Write...

### 4.3 Conclusion

In this chapter, we proposed another distributed algorithm for XYZ. This algorithm has both time complexity of  $O(n)$  where  $n$  is the total number of nodes. In next chapter, we conclude and discuss some of the future aspects.





# Chapter 5

## Conclusion and Future Work

write results of your thesis and future work.



# References