



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A’ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**COURSE NAME : 19EC513 – IMAGE PROCESSING AND COMPUTER
VISION**

III YEAR / V SEMESTER

Unit V- Computer vision

**Topic : Introduction to computer vision – Image formation
and processing**

Introduction to computer vision – Image formation and processing/ 19EC513/ IMAGE PROCESSING AND COMPUTER
VISION /Mr.S.HARIBABU/ECE/SNSCE



COMPUTER VISION

Computer Vision is a field of Artificial Intelligence(AI) that enables the computer and systems to derive meaningful information from digital images, videos and other visual inputs - and take actions or make recommendations based on that information.

If AI enables computers to think, computer vision enables them to see, observe and understand.

Eg, Computer vision is necessary to enable self-driving cars. Manufacturers such as Tesla, BMW, Volvo and Audi use multiple cameras, lidar, radar and ultrasonic sensors to acquire images from the environment so that their self-driving cars can detect objects, lane markings, signs and traffic signals to safely drive.



APPLICATIONS OF COMPUTER VISION

1. Optical Character Recognition
2. Machine Inspection
3. Retail
4. 3D modelling building(photogrammetry)
5. Automotive safety
6. Match move
7. Motion capture
8. Surveillance
9. Fingerprint recognition and biometrics

HISTORY OF COMPUTER VISION

- Larry Roberts is commonly accepted as the father of computer vision.
- Computer Vision came into existence during the 1960's

LEVELS OF HUMAN AND COMPUTER VISION SYSTEM :

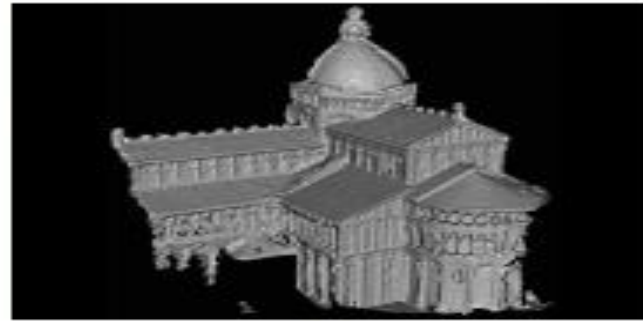
Low Level Vision : Edge , Corner, Stereo reconstruction

Mid Level Vision : Texture, Segmentation and Grouping , illumination

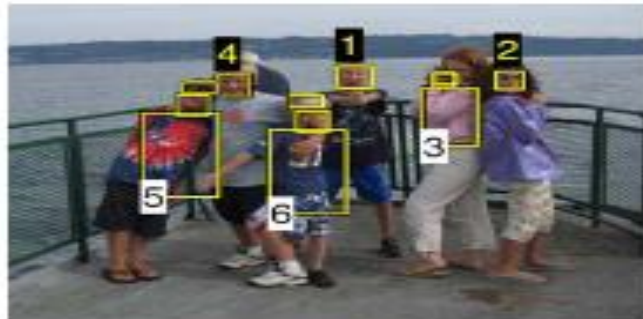
High Level Vision :Tracking, Specific Object recognition , Category level object recognition



(a)



(b)





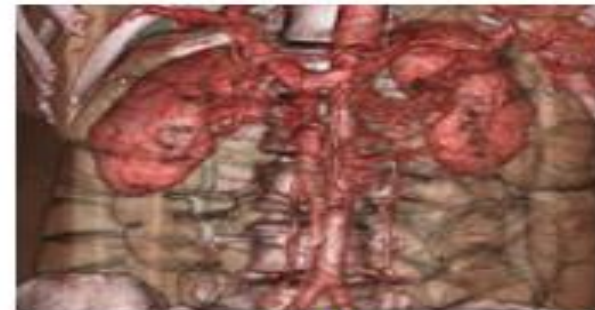
(a)



(b)



(c)



(d)



(e)



(f)



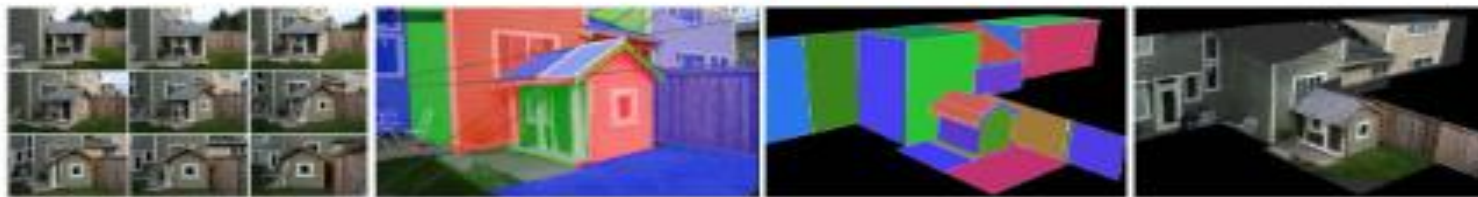
(a)



(b)



(c)

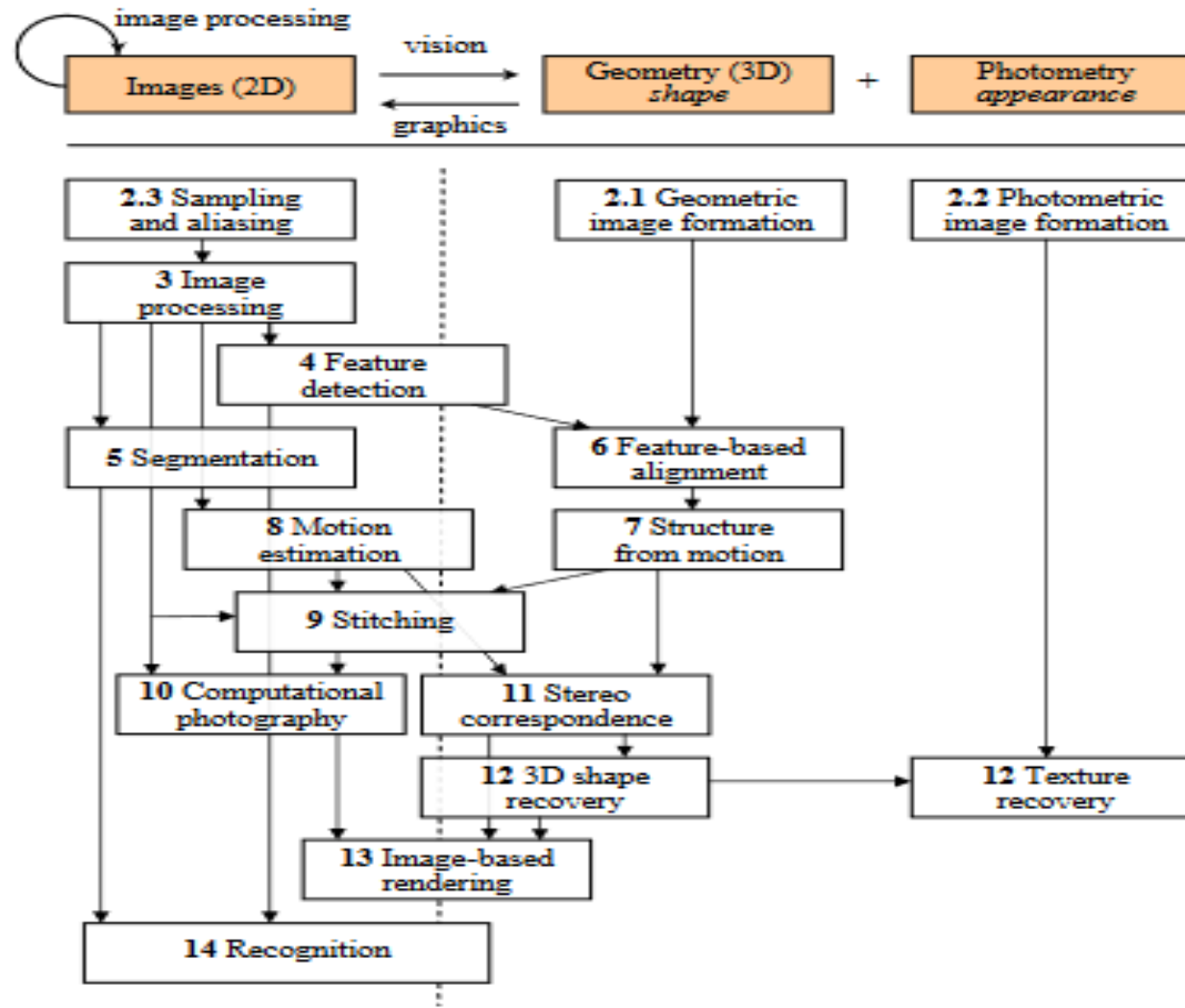


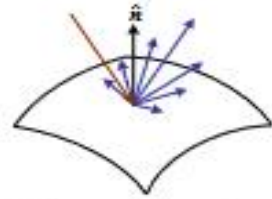
Input Photographs

2D Sketching Interface

Geometric Model

Texture-mapped model





2. Image Formation



3. Image Processing



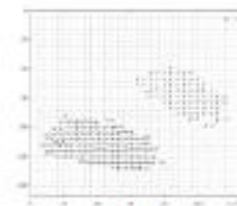
4. Features



5. Segmentation



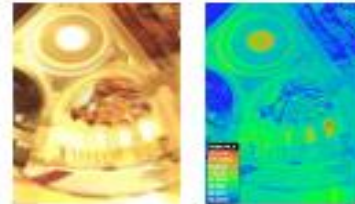
6-7. Structure from Motion



8. Motion



9. Stitching



10. Computational Photography



11. Stereo



12. 3D Shape



13. Image-based Rendering



14. Recognition



THANK YOU !!!