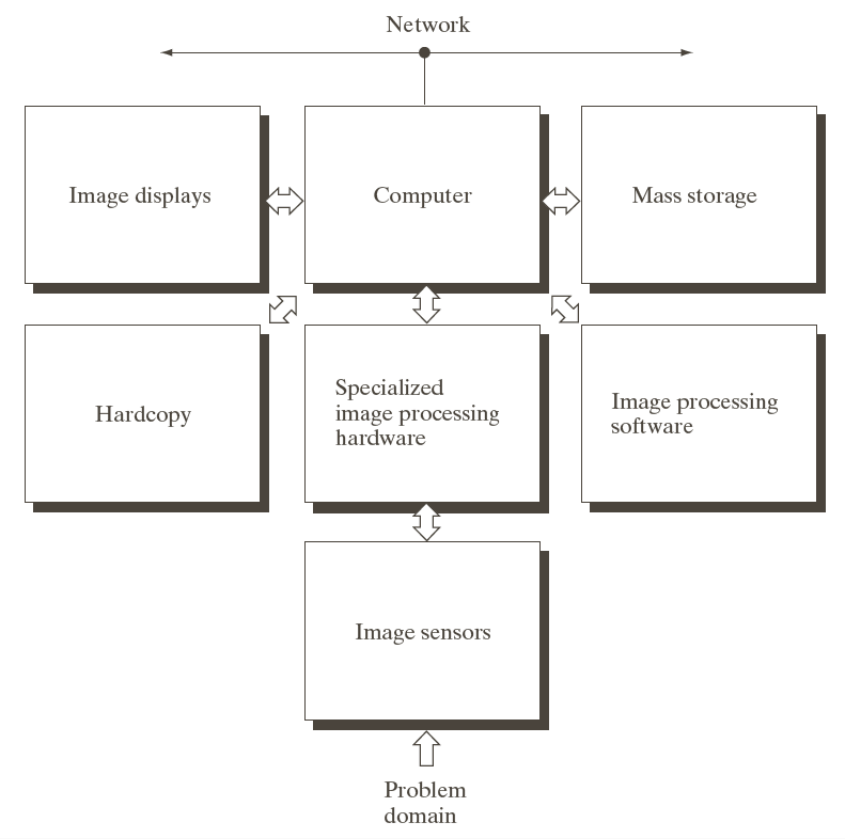
19CSE367 Digital Image Processing

SARATH TV

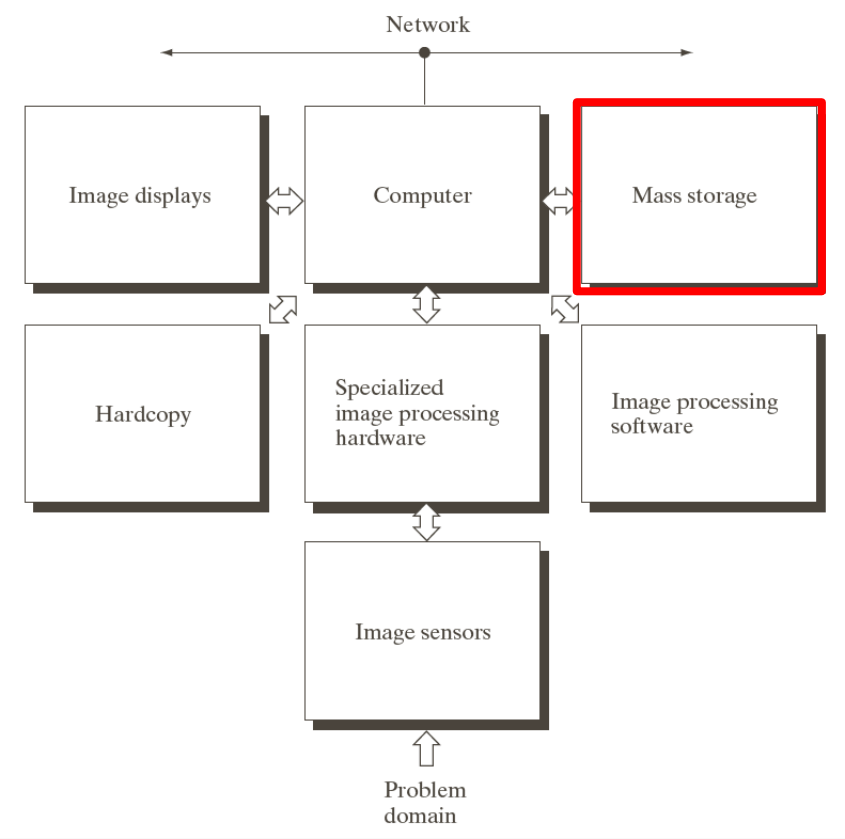
Last Lecture

- Digital Image
- Various applications
- Basic steps in DIP
- Components of DIP system

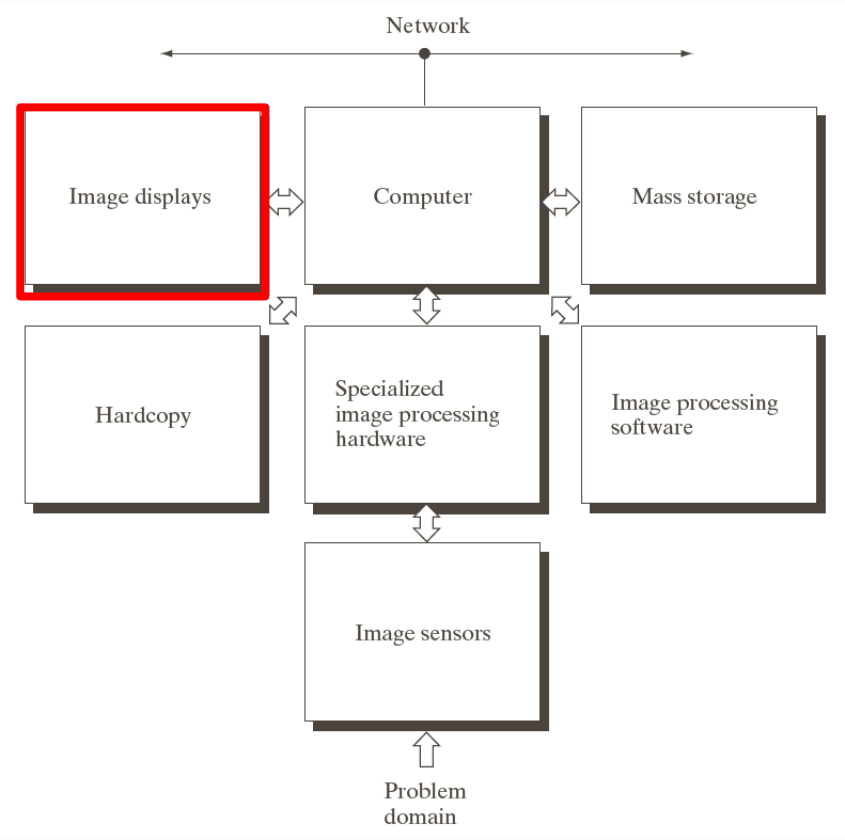
Components of DIP system



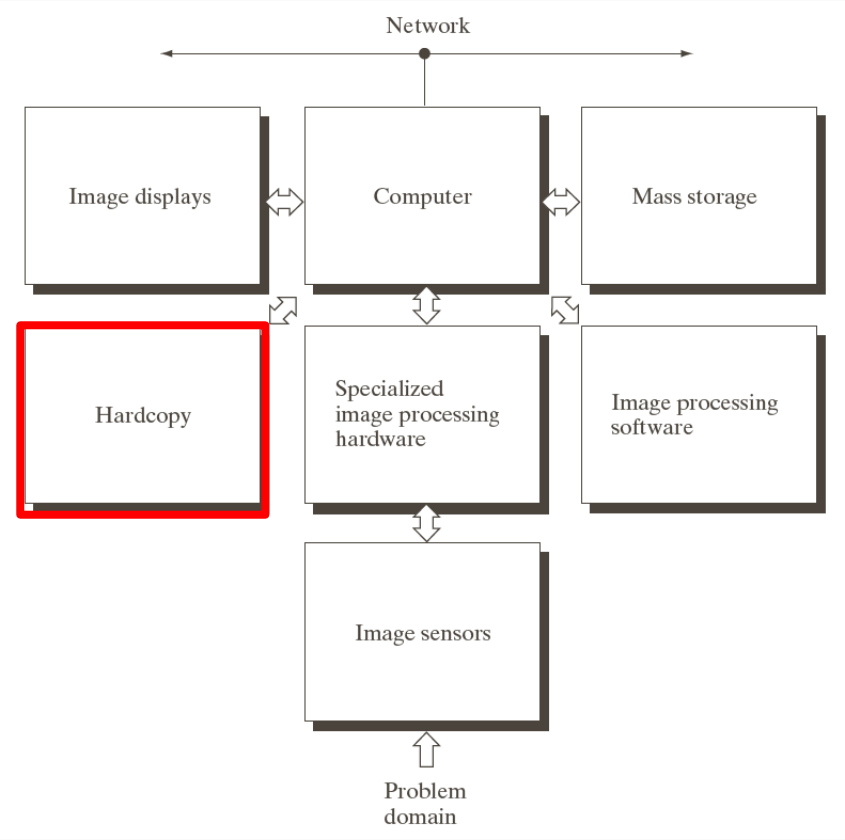
Components of DIP system



Components of DIP system



Components of DIP system



Components of DIP system

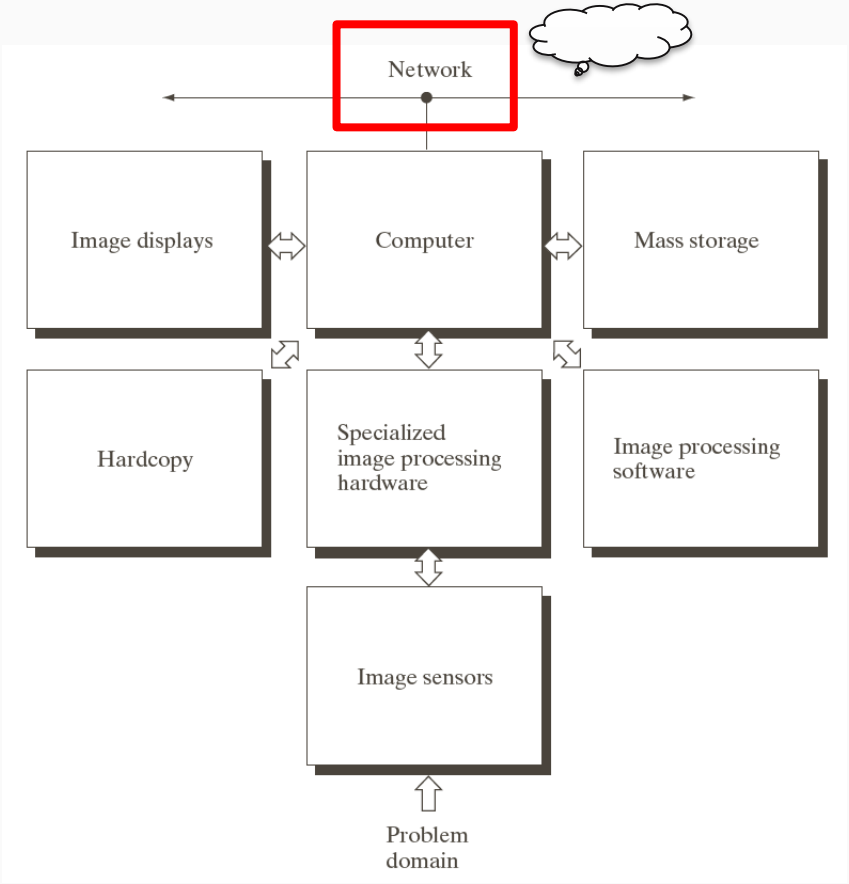
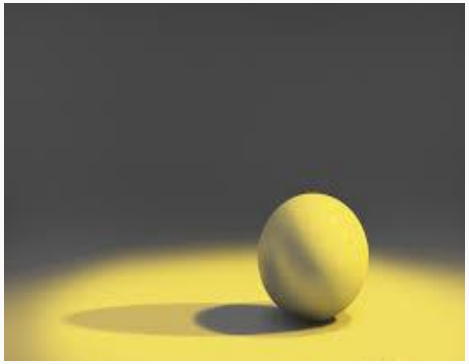
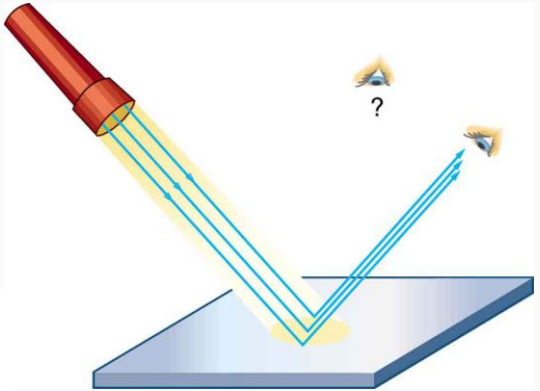
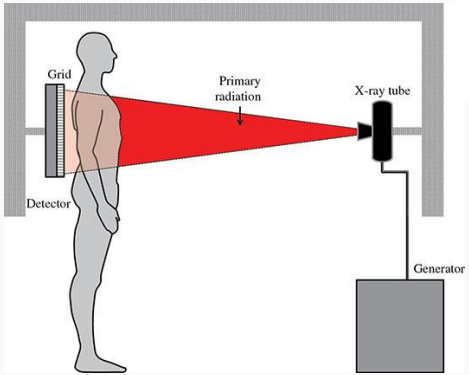


Image Sensing & Acquisition

- Generation of images-combination of “ illumination” source and the absorption of energy by source by the elements of “scene” .
- Illumination source – Source of EM energy- Radar, infrared, X-Ray, Ultrasound.
- Scene –objects ,buried rock, human brain.
- Reflection – From objects
- Transmission- Through objects.







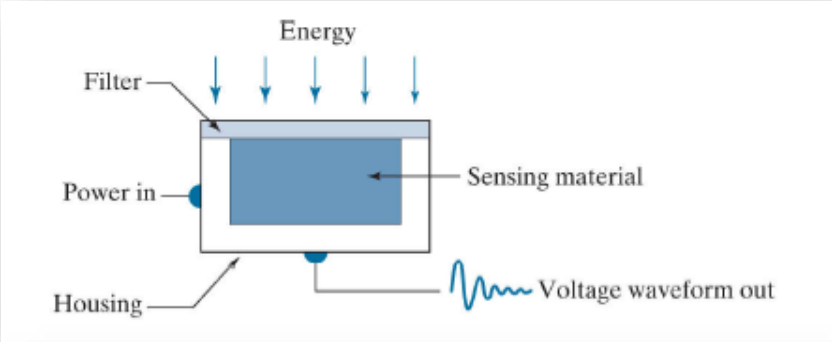
Sensor

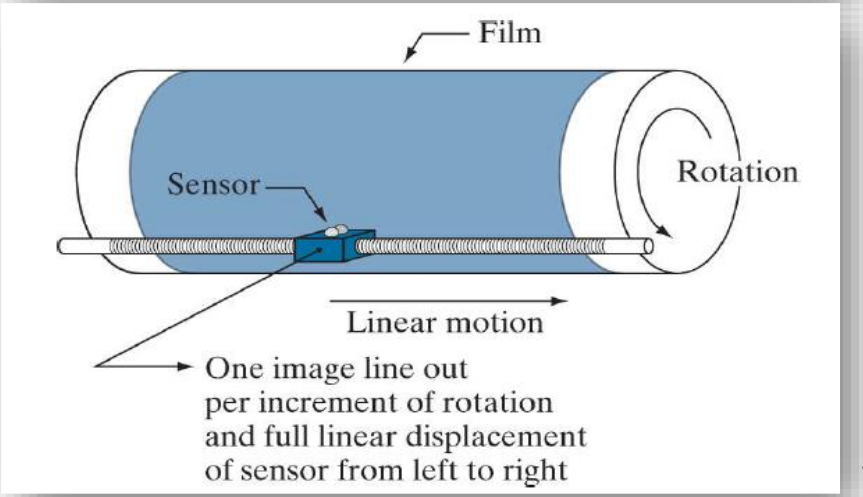
Transform the incident energy into digital images.

- Incoming energy converted into voltage using input electrical power and sensor material.
- Sensor material- depend on type of energy being detected.
- Voltage- output of sensor.
- Digitize the response to obtain the digital quantity.

Using a Single Sensing Element

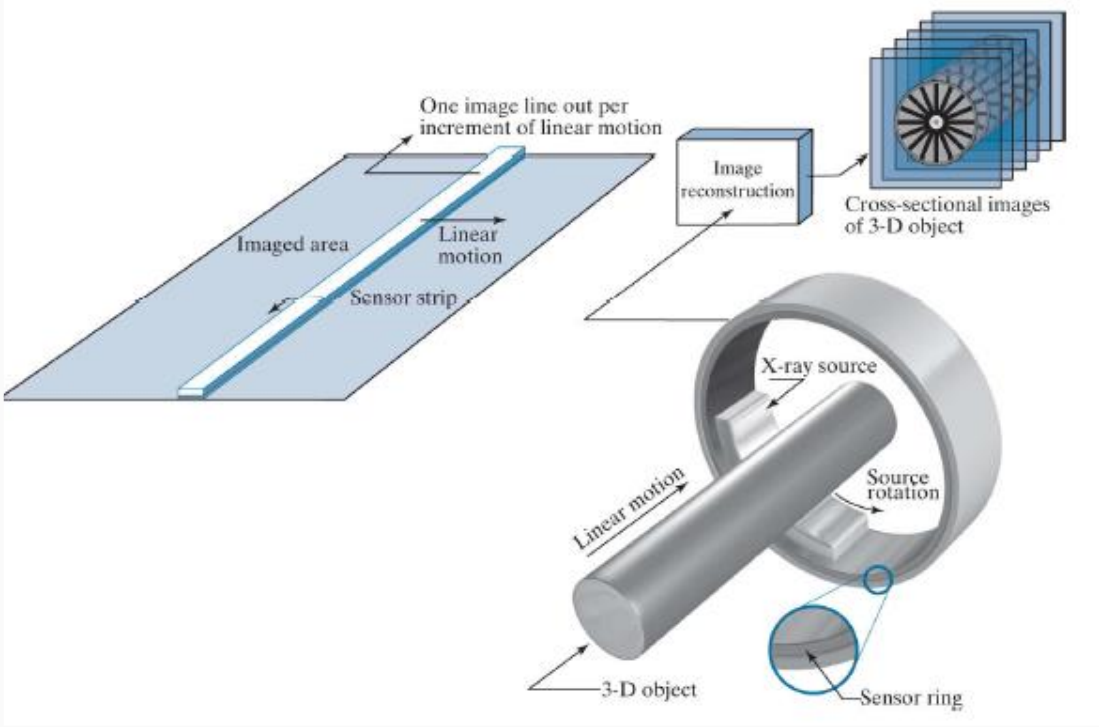
- Photodiode
- 2D images from single sensor
- Displacements in x & y directions.
- Eg. High precision scanning.
- Film negative on a rotating drum
- Rotations –displacement in one direction.
- The sensor on screw- motion in the perpendicular direction.
- Light source inside the drum.



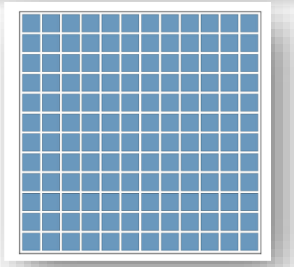


Using linear sensor

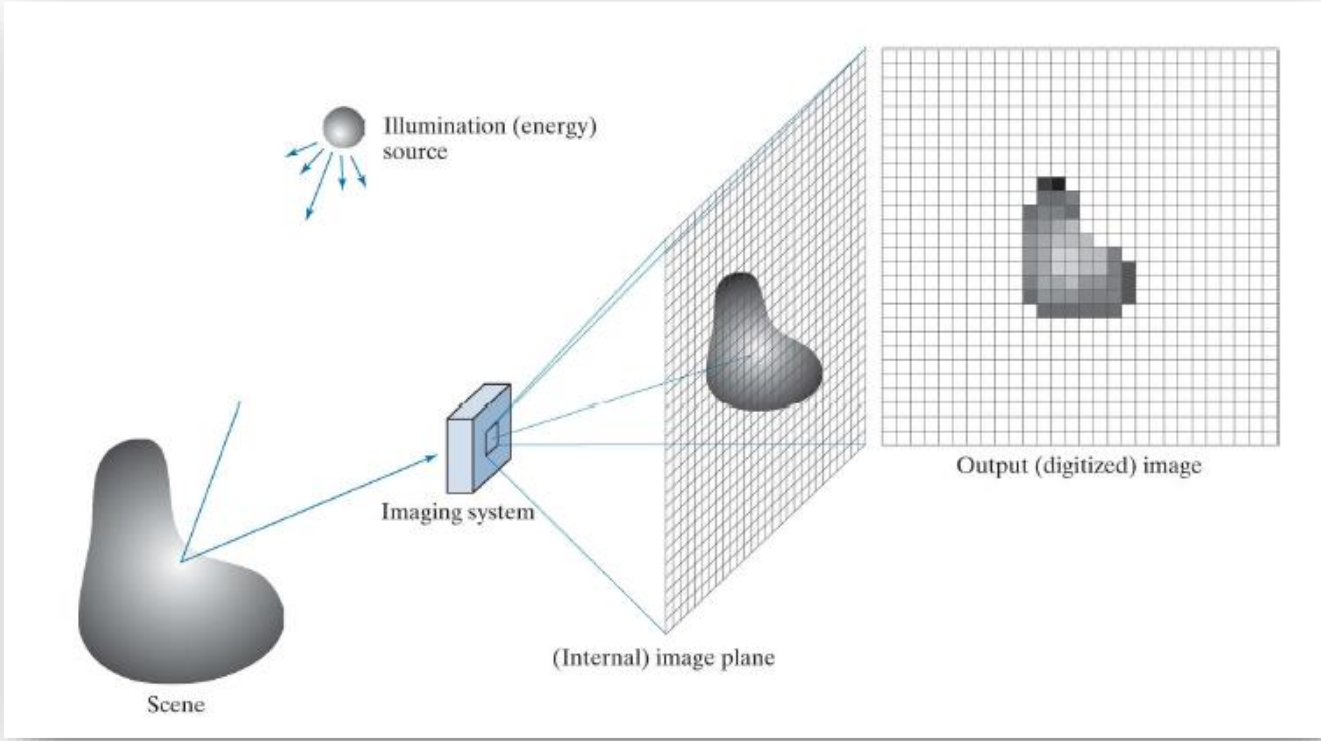
- In-Line sensor strip.
- Provides elements in one direction.
- Motion perpendicular to the strip.
- Flat bed scanners, air borne imaging
- One line of image at a time
- Motion of strip –completes the other dimension.
- Ring configuration



Using sensor array



- Electromagnetic and ultrasonic sensing devices.
- Response of each sensor proportional to integral of light energy projected onto the surface of sensor.
- Noise reduction- integrate the input light signal over period of time.
- Focus the energy pattern onto the surface of the array.
- Motion not necessary.




THANK YOU!