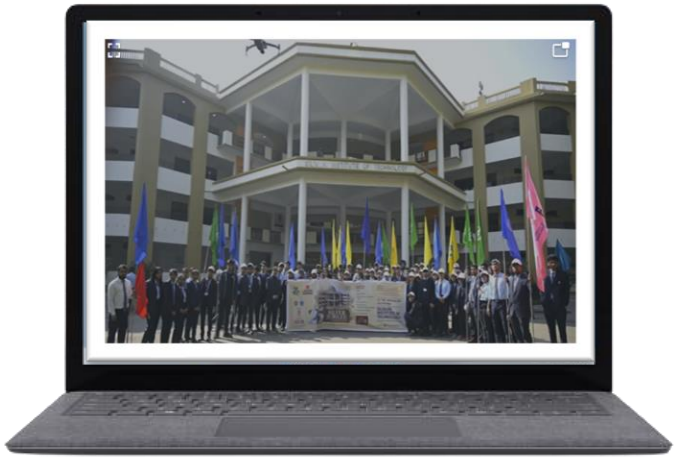

Components of Image Processing System

Components of Image Processing

- Mid 1980- substatntial peripheral devices that attached to quality substantial host computer
- Late 1980 and early 1990- image processing hardware were single board compatiable with industry standard buses, engineering workstation, cabinets and personal computers.
- Till date- there is a reduction in cost miniturization and application specific system.

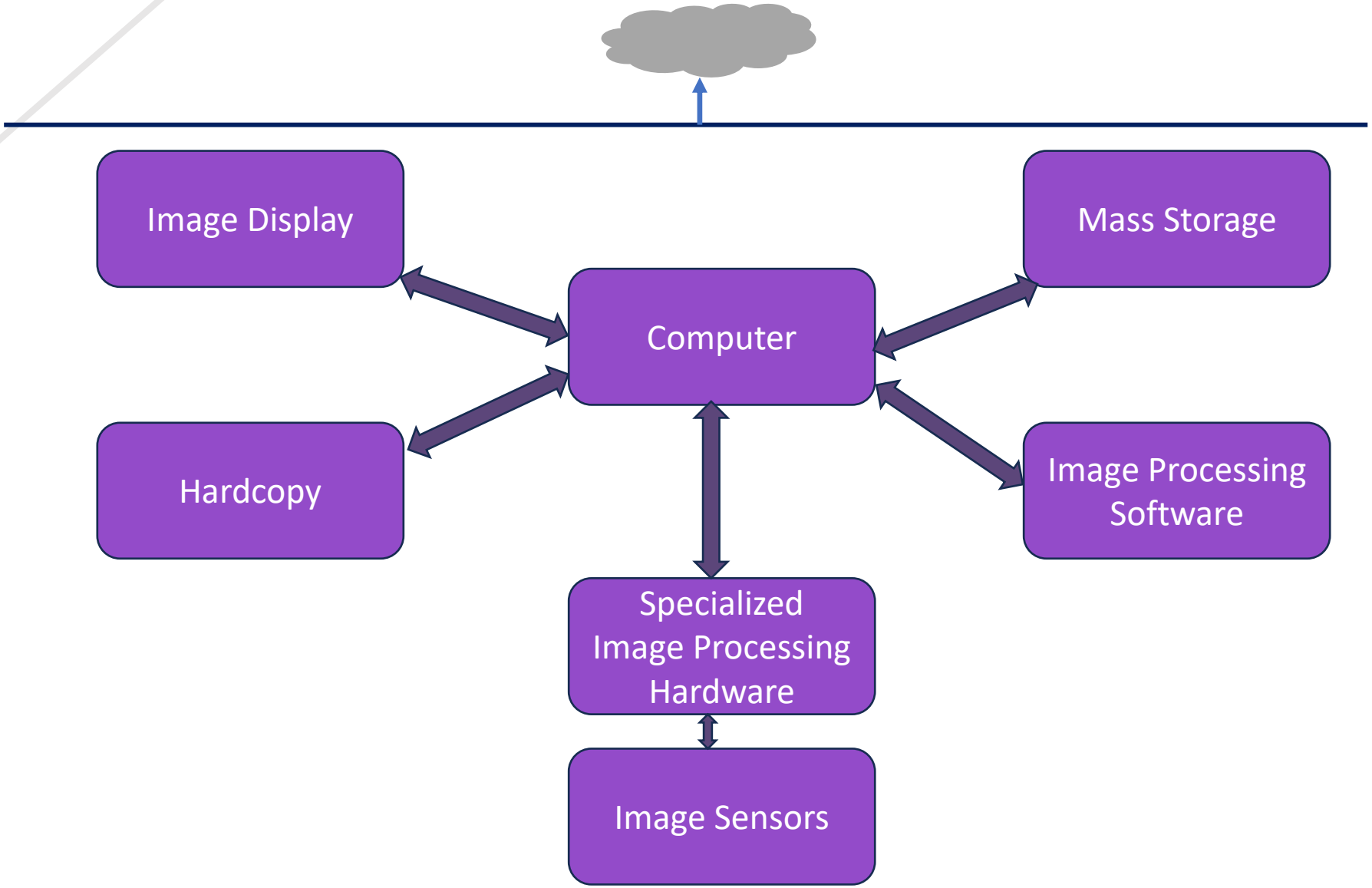
Image Display
Mass Storage
Computer
Hardcopy
Image Processing Software
Specialized Image Processing Hardware
Image Sensors

Image Sensor

- Sense the energy reflected from the object
- Two elements are required to acquire digital image.
- The first is the physical device that is sensitive to the energy radiated by the object we wish to image.
- The second called digitizer, is a device for converting the output of the physical sensing device to digital form.

Specialized Image Processing hardware

- This type of hardware sometimes called front end subsystem, and its most distinguishing characteristic is speed.
- This unit performs functions that requires fast data throughput that typically main computer cannot handle.
- Consists of digitizer plus hardware that performs other primitive operations such as an arithmetic logic unit(ALU), that perform arithmetic and logical operations in parallel on entire image.

Computer

- a general-purpose computer and can range from a PC to a supercomputer.
- In dedicated applications, sometimes custom computers are used to achieve a required level of performance.
- In these systems, almost any well-equipped PC-type machine is suitable for off-line image processing tasks.

Image Processing Software

- consists of specialized modules that perform specific tasks.
- A well-designed package also includes the capability for the user to write code that, as a minimum, utilizes the specialized modules.
- More sophisticated software packages allow the integration of those modules and general-purpose software commands from at least one computer language.

Mass Storage

- Must in image processing applications
- An image of size 1024 × 1024 pixels, in which the intensity of each pixel is an 8-bit quantity, requires one megabyte of storage space if the image is not compressed.
- When dealing with image databases that contain thousands, or even millions, of images, providing adequate storage in an image processing system can be a challenge.

Image Display

- are mainly color, flat screen monitors.
- Monitors are driven by the outputs of image and graphics display cards that are an integral part of the computer system.
- Seldom are there requirements for image display applications that cannot be met by display cards and GPUs available commercially as part of the computer system.

Hardcopy

- Hardcopy devices for recording images include laser printers, film cameras, heatsensitive devices, ink-jet units, and digital units, such as optical and CD-ROM disks.
- Film provides the highest possible resolution, but paper is the obvious medium of choice for written material.

Networking and Cloud

- default functions in any computer system in use today.
- As the large amount of data inherent in image processing applications, the key consideration in image transmission is bandwidth.
- In dedicated networks, this typically is not a problem, but communications with remote sites via the internet are not always as efficient.
- Image data compression continues to play a major role in the transmission of large amounts of image data.

Reference

- E Woods, Richard, and Rafael C Gonzalez. "Digital image processing." (2008).