



TRINITY COLLEGE FOR WOMEN NAMAKKAL

Department of Computer Science

DIGITAL IMAGE PROCESSING

19PCS12-ODD SEMESTER

Presented by

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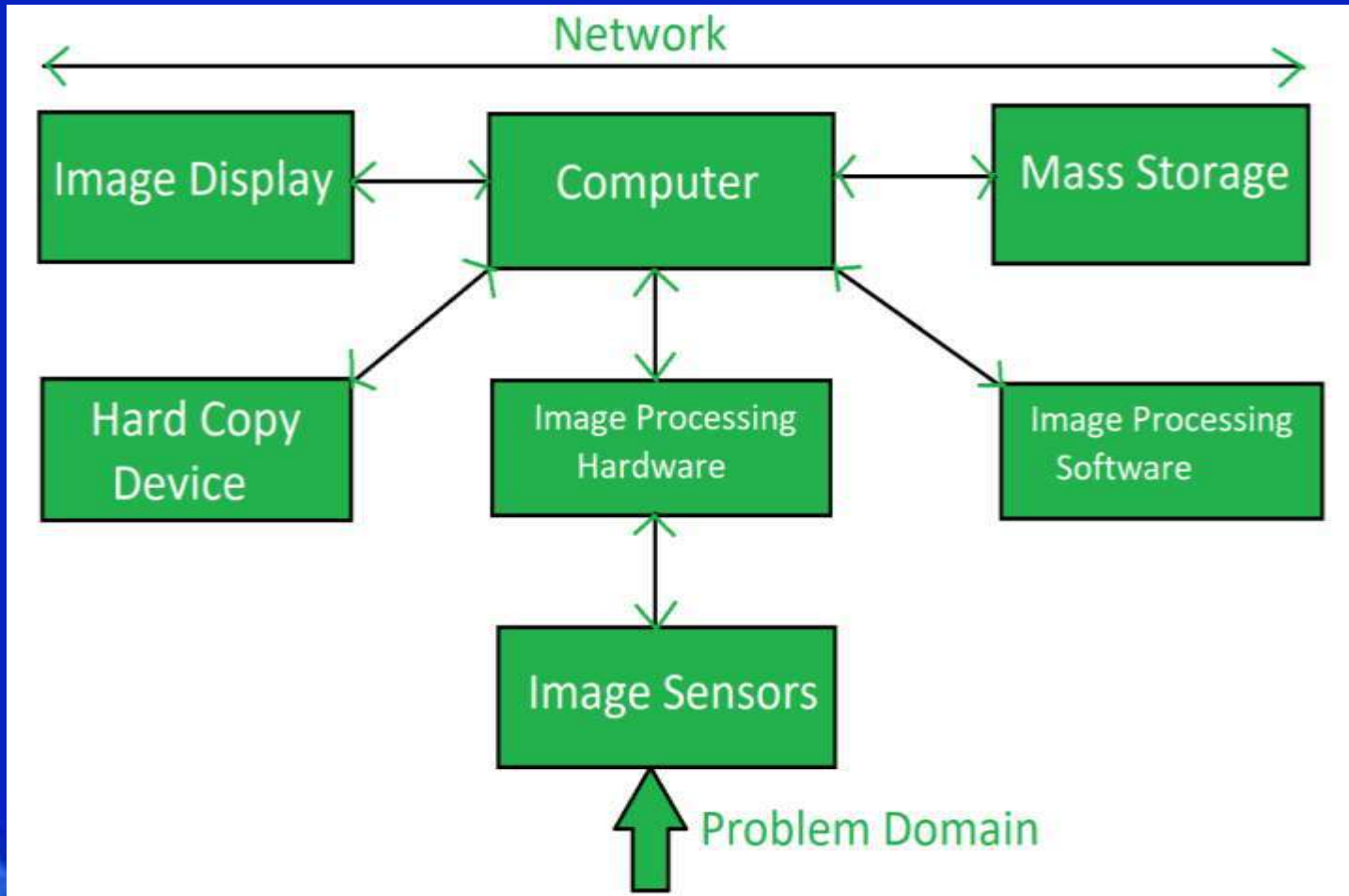
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DIGITAL IMAGE PROCESSING

- Digital image processing deals with manipulation of digital images through a digital computer. It is a subfield of signals and systems but focus particularly on images.
- The common applications of Image sharpening and restoration are zooming, blurring, sharpening, grayscale conversion, edges detecting, Image recognition, and Image retrieval, etc.

COMPONENTS OF AN IMAGE PROCESSING SYSTEM



LINEAR INTEGRAL TRANSFORMS

- An integral transform is a linear operation that converts a function, $f(x)$, to another function, $F(u)$, via the following integral: (10)
The function $K(x, u)$, known as the kernel of the transform, and the limits of the integral are specified for a particular transform.
- The idea behind a transform is very simple. To be definite suppose that we want to solve a differential equation, with unknown function f .

DATA STRUCTURES FOR IMAGE ANALYSIS

- Matrices, chains, graphs, lists of object properties, relational databases, etc. used not only for the direct representation of image information, but also as a basis of more complex hierarchical methods of image representation.
- Data pre-processing or data cleansing is a crucial step and most of the ML engineers spend a good amount of time

THRESHOLDING

- Thresholding is a type of image segmentation, where we change the pixels of an image to make the image easier to analyze.
- In thresholding, we convert an image from color or grayscale into a binary image, i.e., one that is simply black and white.
- Thresholding is a very popular segmentation technique, used for separating an object from its background.

REGION-BASED SEGMENTATION

- In this segmentation, we grow regions by recursively including the neighboring pixels that are similar and connected to the seed pixel.
- We use similarity measures such as differences in gray levels for regions with homogeneous gray levels.
- We use connectivity to prevent connecting different parts of the image.

KNOWLEDGE REPRESENTATION

- A knowledge representation (KR) is a surrogate, a substitute for the thing itself, used to enable an entity to determine consequences by thinking rather than acting, i.e., by reasoning about the world rather than taking action in it.
- The knowledge module and the reasoning module allow the determination of atomic algorithms which are necessary for the detection execution.

NEURAL NETS

- Image recognition is one of the tasks in which deep neural networks (DNNs) excel.
- Neural networks are computing systems designed to recognize patterns.
- Their architecture is inspired by the human brain structure, hence the name.
- They consist of three types of layers: input, hidden layers, and output..

THANK YOU

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