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Faculty of IS & CS

IMAGE PROCESSING

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Assignment 1

Image Processing; Signals and Systems

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Image Processing; Signals and Systems

1. When the input of a system is an image, and the output is also an image is done, it is called image recognition system. (False – True)
2. When the input of a system is an image, and the output is also an image is done, it is called in image (analysis – processing – pre-processing) system.
3. What are the main types of Image processing system?
4. Analog image processing is done on analog signals. It includes processing on (one – two – three) dimensional analog signals.
5. Digital image processing deals with developing a (digital – analog) system that performs operations on a digital (image – signal).
6. Digital image processing has dominated over analog image processing with the passage of frequency due to its wider range of applications. (False – True)
7. It is defined by the mathematical function f(x,y) where x and y are the two co-ordinates horizontally and vertically. (False – True)
8. Since anything that conveys ---------- some information ---------- or broadcast a ---------- message ---------- in physical world between two observers is a signal. That includes speech or (human voice) or an ---------- image ---------- as a signal.

9. Since when we speak, our voice is converted to a sound wave/signal and transformed with respect to the ----------time---------- to person we are speaking to.
10. Capturing an image from a camera is a physical process. A sensor array is used for the processes of the image. So, when the sunlight falls upon the object, then the amount of light refracted by that object is sensed by the sensors, and a continuous voltage signal is generated by the amount of sensed data. (False – True)
11. In order to create a digital image, we need to convert this data into a digital form. This involves ----------sampling---------- and ----------quantization----------.
12. The result of sampling and quantization operations for digitalizing the images, results in a ----------dimensional---------- array or matrix of numbers which identifying the digital image.
13. In fact, any quantity measurable through time over space or any higher dimension can be taken as a (image – signal – information). A signal could be of any dimension and could be of any form.
14. A signal could be an analog quantity that means it is defined with respect to the ----------time----------. It is a continuous signal.
15. In order to store these signals, you require an infinite memory because it can achieve finite values on a real line. (False – True)

16. Analog signals are denoted by sin waves. Y = sin(x) where x is (dependent - independent).
17. Digital signals are very easy to analyze. They are ----discontinous---- signals.
18. Digital signals: The word digital stands for ----discrete---- values and hence it means that they use specific values to represent any information.
19. Digital signals are (less – more) accurate than analog signals because they are the discrete samples of an analog signal taken over some period of time. However digital signals are not subject to (noise – interference).
20. Digital signals: last long and are easy to interpret. Digital signals are denoted by square waves. (False – True)
21. States in a table the differences between analog and digital signals?
22. Define a system for a signal?
23. There are two main concepts that are involved in the conversion: Sampling and ----quantization----.
24. There are two main concepts that are involved in the conversion: Sampling and Quantization. Define in brief each conversion aided with drawings?
25. Why do we need to convert an analog signal to digital signal?

Good Luck