Q1. Study and analyze recent techniques of noise removing in medical images?

Ans:-

The techniques of noise removing in medical images are:

1. *Gaussian Noise*
    - *Gaussian distribution which is also known as normal distribution whose Probability Density.*
    - *Function is equal to statistical noise known as Gaussian Noise.*
    - *This noise is removed from the digital images by smoothening of the image pixels which helps in reducing the intensity of the noise present in the image which is caused due to acquisition but the result maybe sometime undesirable and*
    - *It can result in blurring edges of the high-quality images.*

2. *Salt And Pepper Noise*
    - *The image which is low in quality has bright and dark pixels present in it which causes noise in it also referred as Salt Pepper noise.*
    - *An image which contains Salt Pepper noise will generally have bright pixels in dark portion and dark pixels in bright portion of the image*
    - *Due to sharp and unexpected changes of image signal the noise arises.*
    - *Dead pixels, analog-to-digital converter errors, bit errors in transmission, etc. are caused due to the presence of Salt Pepper noise in the image.*
3. *Poisson Noise*
    - *It is an electronic noise that occurs in an image when the limited number of particles that carry energy, such as electrons in an electronic circuit or photons in photosensitive device, is small enough to give rise to detectable statistical variations in a measurement.*
4. *Blurred Noise*
    - *Blurred Noise is caused due to the light intensity and external factors.*
    - *Capturing reasonable photos under low light conditions using a hand-held camera can be annoying experience.*
    - *These kinds of images containing hazy and blurred pixels are referred to as Blurred Noise which is present in the image.*
5. *Speckle Noise*
    - *It is defined as a noise which is present in the images and which degrades the quality of an image.*
    - *It is a phenomenon that convoys all coherent imaging modal quality in which images are produced by interfering echoes of a transmitted waveform that originate from diversity of the studied objects.*
    - *These are the granular noises that are fundamentally present in the image and reduce the quality of the active radar and Synthetic Aperture Radar (SAR) images or Magnetic Resonance.*
    - *Imaging (MRI) images is referred to as Speckle Noise.*

Q2. Applications of Fourier Transformations in other domains?
Ans:-

- *Designing electrical circuits*
- *Signal analysis*
- *Solving differential equations*
- *Signal Processing*

Q3. Restoring a damaged image using any online tool.

Ans:-

Link of the website where I have executed

Colorize pictures: turn black and white photos to color with AI - Hotpot.ai

Input Image

Output Image

Q4. Impact of Fourier Transformations in enhancing the images?

Ans:-

The Fourier Transform is an important image processing tool which is used to decompose an image into its sine and cosine components. The output of the transformation represents the image in the Fourier or frequency domain, while the input image is the spatial domain equivalent.

Q5. Examine impact of hybrid techniques for enhancement of images?

Ans:-

- *They have difficulty for some techniques in removing high-density noise. But in removing high-density noise the quality of images gets damaged.*