



## **Puzzles-Biomedical Image Processing**

## 1. The Blurry Vision Puzzle

♦ A medical X-ray image appears **blurry** due to motion artifacts.
Which image enhancement technique would you apply to **sharpen the details**?

- A) Gaussian Smoothing
- B) Unsharp Masking
- C) Histogram Equalization
- D) Contrast Stretching

**P** Hint: You need to enhance edges without adding too much noise!

## 2. The Lost Contrast Mystery

♦ An MRI scan has low contrast, making it difficult to differentiate tissues. Which technique will help improve visibility?

A) Adaptive Histogram Equalization
B) Low-pass filtering
C) Min-Max Normalization
D) Log Transformation

**• Hint:** Think about how contrast adjustment works on dark and bright areas.

## 3. The Hidden Details Puzzle

♦ A CT scan contains a **faint tumor** that is barely visible to the human eye. How can you **bring out the hidden details**?

- A) Applying a Laplacian Filter
- **B) Increasing Brightness Only**

## C) Using Fourier Transform for Edge Enhancement

#### D) Reducing Image Noise

**P** Hint: A sharp contrast in pixel intensity often helps in detection.

## 4. The Old Photograph Riddle

♦ You have a **noisy and faded** medical X-ray image from an old archive.
What combination of techniques will help **restore** it?

A) Noise Reduction + Contrast Adjustment
B) Edge Detection + Fourier Transform
C) Color Enhancement (HSV Transform)
D) Simple Histogram Equalization

**P** Hint: Noise and contrast issues often go hand-in-hand in old images.

## 5. The Night Vision Challenge

♦ A low-light endoscopic image needs enhancement for better diagnosis.
Which approach would enhance visibility without adding noise?

A) Gamma Correction
B) Low-Pass Filtering
C) Adaptive Histogram Equalization
D) Both A and C

**P** Hint: Look for non-linear transformations that work well in low-light conditions.

### 6. The MRI vs CT Dilemma

♦ You need to enhance **both MRI and CT images**, but they have **different noise characteristics**.
Which method will work best **for both**?

A) Gaussian Filter for MRI, Median Filter for CT

**B) Unsharp Masking for Both** 

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# C) Edge Detection for BothD) Contrast Adjustment Only

**P** Hint: MRI is prone to Gaussian noise, while CT scans often have salt-and-pepper noise.