**Lesson 3: Image Filtering Techniques**

Description:  
This lesson covers the most common image filtering methods used to improve image quality and highlight specific features.

**What is Image Filtering?**  
Image filtering is the process of modifying or enhancing an image by applying a filter (or kernel) that operates over the image pixels.

**Types of Filters**

* **Low-pass filters**: Used to remove noise or blur an image (e.g., average, Gaussian filter).
* **High-pass filters**: Used to enhance edges or fine details (e.g., Laplacian filter).
* **Median filter**: A non-linear filter that replaces each pixel with the median of its neighbors—very effective at removing salt-and-pepper noise.

**Convolution Operation**  
Understand how filters are applied to an image using a mathematical operation called **convolution**, which involves sliding the kernel over the image matrix.

**Practical Applications**

* Blurring an image before edge detection
* Noise reduction in medical or satellite images
* Sharpening images for better visual appearance

**Outro**  
A quick summary of how filtering plays a key role in both image enhancement and preparation for feature extraction.