```matlab
% Load the image from file
img = imread('image_signal.png');

% Convert the image to grayscale if it has multiple color channels
if size(img, 3) == 3
    grayscale_img = rgb2gray(img);  % Perform conversion if it's a color
image
else
    grayscale_img = img;  % If the image is already grayscale, no change is
needed
end

% Display the original grayscale image
figure, imshow(grayscale_img), title('Original Grayscale Image');
```
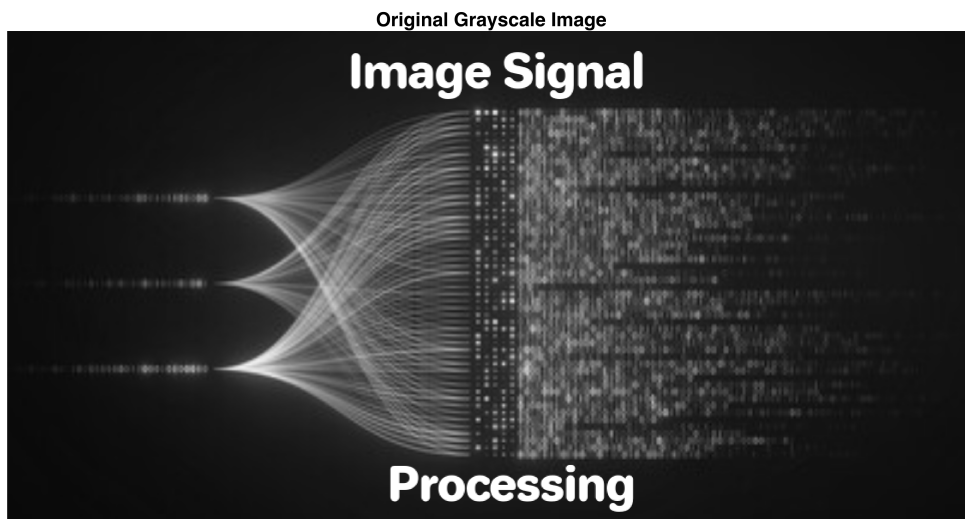
Original Grayscale Image


```matlab
% Normalize pixel values to the [0, 1] range
normalized_img = im2double(grayscale_img);  % Converts image to double
precision and normalizes

% Reduce grayscale levels by resizing
resize_factor = 1/8;  % Set the scale factor for reducing the grayscale
resolution
downsized_img = imresize(normalized_img, resize_factor);  % Resize to lower
the number of grayscale levels

% Restore the image to its original dimensions
upsampled_img = imresize(downsized_img, size(grayscale_img));  % Resize
back to the original size

% Quantize the image to 32 grayscale levels
quantized_img = round(upsampled_img * 31) / 31;  % Reduce grayscale levels
to 32 distinct values
```

```
% Show the quantized image
figure, imshow(quantized_img), title('Quantized Image with 32 Grayscale
Levels');
```

Quantized Image with 32 Grayscale Levels