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## **Week 5 Report: Dataset Collection & Preprocessing**

Project: InfraScan - AI-Powered Structural Health Monitoring

Organized by: DesCon Society, IIT Kanpur

### Step 1: Dataset Collection

We collected 5 infrared and structural crack images from platforms like Kaggle,. These included crack patterns, moisture stains, and defect signatures.

### Step 2: Annotation

Using makesense.ai, we labeled defects (crack, moisture, defect) by drawing bounding boxes and exported annotations in YOLO format.

### Step 3: Preprocessing in MATLAB

- Grayscale Conversion: Reduced image complexity.
- Gaussian + Median Filtering: Removed noise while preserving edges.
- Histogram Equalization: Enhanced contrast.
- Adaptive Binarization: Separated defects from background under varying light.
- Normalization: Scaled image intensities to 0–1 for consistent learning.

### Step 4: Observations

After preprocessing, crack features appeared sharper, noise was reduced, and contrast was significantly improved. These cleaned images are now ready for CNN training in Week 6.