

# OVERVIEW

- This project aims to develop an automated system for detecting changes related to human activities using satellite imagery. It focuses on identifying changes in man-made objects such as vehicles, buildings, roads, and more from Sentinel-2 and LISS-4 datasets
- It leverages AI/ML techniques for efficient semantic segmentation and change detection, enabling applications in urban planning, environmental monitoring, and disaster response

# MODEL DEVELOPMENT

## 1. Data Collection and Preprocessing:

- Resize, normalize, and segment images into patches for model input.

## 2. Segmentation

- The data provided is divided into patches that are being masked and labels are given according to different landmass

## 3. Masking:

- The segmented patches are merged again to create a final masked image

## 4. Change Detection:

Change in the temporal images is detected by looking at change in labels

## 5. Final Image:

- The labels changed due to human activities are coloured and final image representing the difference is obtained

# RESULTS

- The trained model successfully detects changes in human-related activities from satellite imagery. Comparisons of original images, ground truth masks, and predictions demonstrate its ability to identify man-made objects accurately.

# CHALLENGES:

- 1. Variations in lighting and seasons affect segmentation accuracy.
- 2. High-resolution satellite data requires significant processing power.
- 3. Temporal data shifts due to satellite motion make alignment difficult.
- 4. Minor changes are hard to detect due to resolution limitations.

# USE CASES:

1



MILITARY

2



AGRICULTURE

3



DISASTER  
RESPONSE

4



ENVIRONMENTAL  
MONITORING

# CONCLUSION

- This project highlights the potential of AI/ML techniques in automating change detection tasks from satellite imagery. By focusing on human-related changes, it opens avenues for diverse applications like urban development, monitoring, and emergency management.

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