**AI-Based Automatic Accident Detection & SOS Alert System in Highways using CCTV Cameras**

**Done By :**

**Gokul Nishandh S T AIDS A 23011101040**

**Prashanth Samkumar AIDS B 23011101100**

**1 . Analysis of Challenges**

**1. Auto-Labeling Limitations**

**Used an auto-labeling system to detect accident frames by analyzing motion changes between frames.  
However, this can cause inaccurate labels if camera shakes or lighting changes are mistakenly identified as accidents.**

**2. Threshold Tuning Challenges**

**Defined thresholds for motion magnitude, standard deviation, and moving pixel ratio to detect anomalies.  
This can lead to false positives or missed detections if the thresholds don’t generalize well across different videos.**

**3. Real-Time Processing on Low-End Devices**

**Optimized the system to work in real-time by processing every 5th frame and using a Decision Tree model.  
This improves speed but can reduce accuracy and may skip frames where accidents actually occur.**

**4. Generalizing Across Camera Angles**

**Normalized feature values to make the model work across videos with different resolutions and angles.  
Still, the model may not perform well on unfamiliar views due to limited variation in training data.**

**5. Manual Frame Labeling Complexity**

**Created a manual labeling tool to mark accident frames more accurately during training.  
But manually reviewing hundreds of frames is time-consuming and may still include human error.**