Flowchart for Real-Time Object Detection with LiDAR and Camera Fusion

1 Flowchart

The following flowchart illustrates the procedure for real-time object detection using LiDAR and camera fusion, covering data acquisition, preprocessing, calibration, fusion, detection, and output.

2 Description

The flowchart illustrates:

- **Start**: System initialization.
- **Data Acquisition**: Parallel LiDAR (point cloud) and camera (image) capture.
- **Preprocessing**: Voxelize LiDAR points, resize camera images.
- **Calibration**: Align LiDAR and camera data; loop back if inaccurate.
- **Fusion**: Project LiDAR points onto image plane.
- **Feature Extraction**: Use PointNet (LiDAR) and CNN (camera).
- **Object Detection**: Detect objects; loop back if none found.
- **Action Recognition**: Identify specific actions (optional).
- **Output**: Generate bounding boxes and labels.
- **End**: Loop back for continuous real-time operation.

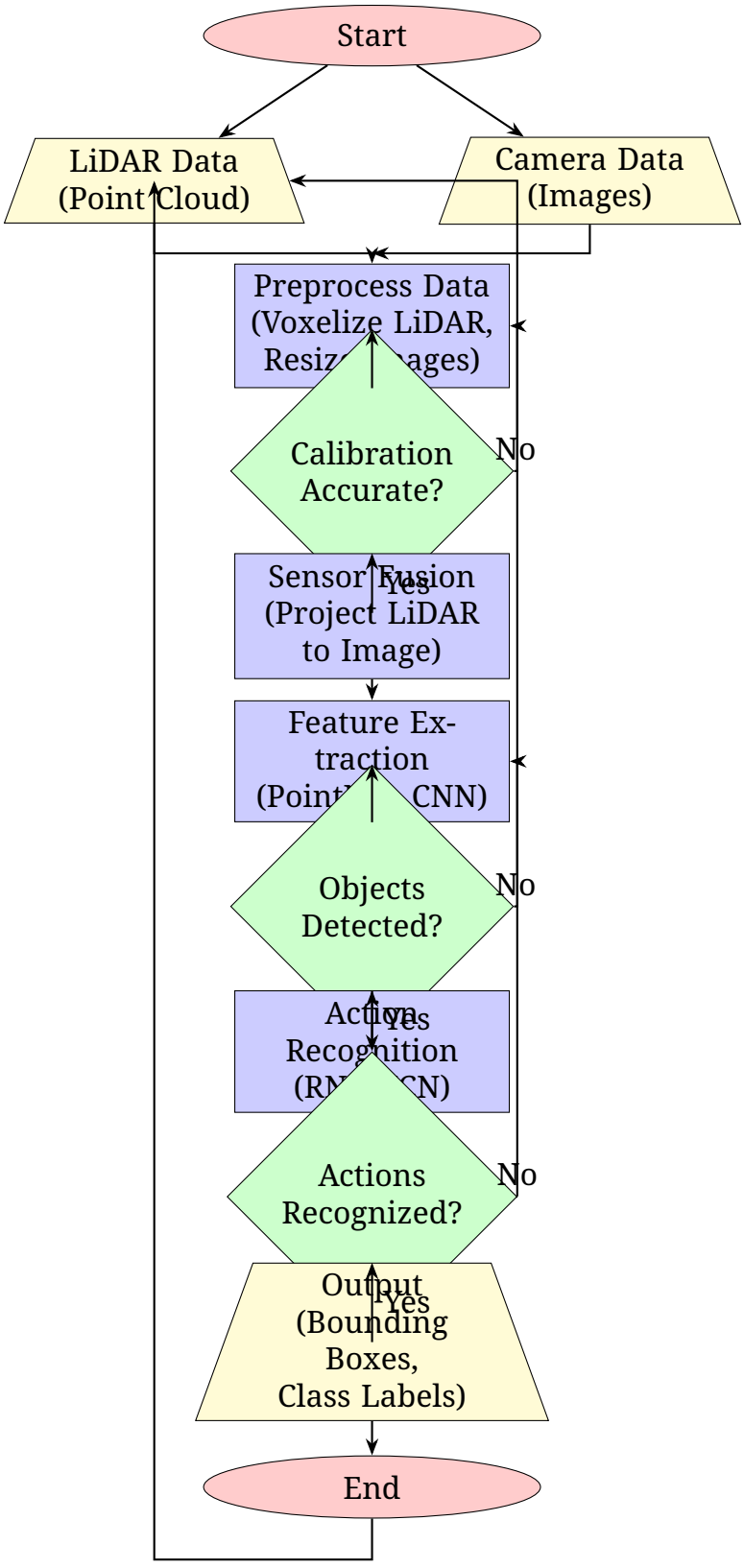

Figure 1: Flowchart for real-time object detection with LiDAR and camera fusion.