

# WaterMark Document

watermark



Effective from: 28-03-2025

Document ID: 003-250304-97493

Published Version: 1.0\_04-03-2025

## WaterMark Document

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**Objective:**

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Document Type	Policy	Document Category	RBI
Document Sub-Category	Risk Related		
Date of Initial Creation	20-03-2025	Date of Document Last Revision/Review	27-03-2025
Document Internal Number	dfsddsdfsf	Document Internal Version Number	dfsd
Document Process Owner/Department	Vishnu Vardhan	Document Approver	Bharth
Name of Authority	Statutory-Companies Act	Nature of Document	Public
Number of Pages in Main Document	10	Number of Support Attachments	1
Document Review Frequency			
Uploaded by	Vishnu Vardhan	Date of Uploading	04-03-2025

## DOCUMENT UPLOAD HISTORY

Upload Number	Upload Date	Document Header/ Reference No.	Review summary/ description
1.0	04-03-2025	NA	NA



# Net Height Measurement software

ADRDE, DRDO

# Failure cases and Solution

## 1. Night-time object detection failure

**Failure Condition:** Objects are hard to detect due to insufficient light, resulting in noisy and unclear frames.

**Solution :**

- **Filters Used:** gaussian filter, laplacian of gaussian.
- **Explanation:** Gaussian filtering reduces noise in low-light frames, and Laplacian of Gaussian emphasizes edges, enhancing object visibility in dark conditions.

## 2. Poor stream quality (low resolution)

**Failure Condition:** The camera feed appears grainy or pixelated, making it difficult to discern objects or track details.

**Solution :**

- **Function Used:** merge hdr.
- **Explanation:** HDR merging combines images with varying exposure levels to produce a single, high-resolution output, ensuring clear and detailed streams.

## Night-time object detection

Activities    Google Chrome

Chat | Ganesh Kandikond x | Mail - Rakesh M - Outlook x | Live Feeds

Screenshot captured  
You can paste the image from the clipboard.

Jan 8 18:34

127.0.0.1:4400/livefeeds

NET HEIGHT MEASUREMENT SOFTWARE

Menu



This screenshot shows a night-time video feed displayed within a software application window titled "NET HEIGHT MEASUREMENT SOFTWARE". The feed captures a scene with a building in the background, some trees in the foreground, and a car parked on the street. The image is dark due to low lighting conditions. A small green rectangular box highlights a specific area near the bottom center of the frame, likely indicating a detected object or region of interest. The software interface includes a top navigation bar with tabs for "Chat", "Mail", "Live Feeds", and the current feed URL "127.0.0.1:4400/livefeeds". A sidebar on the left contains various icons for other applications and functions. A tooltip message at the top right of the screen says "Screenshot captured" and "You can paste the image from the clipboard.", with a timestamp of "Jan 8 18:34".

### 3. Over exposed frames in sunlight

**Failure Condition:** Bright sunlight leads to washed-out frames, where objects become indistinguishable due to excessive brightness.

**Solution :**

- **Filter Used:** gamma correction.
- **Explanation:** Dynamically adjusts the brightness to correct overexposure, ensuring objects are visible in high-light environments.

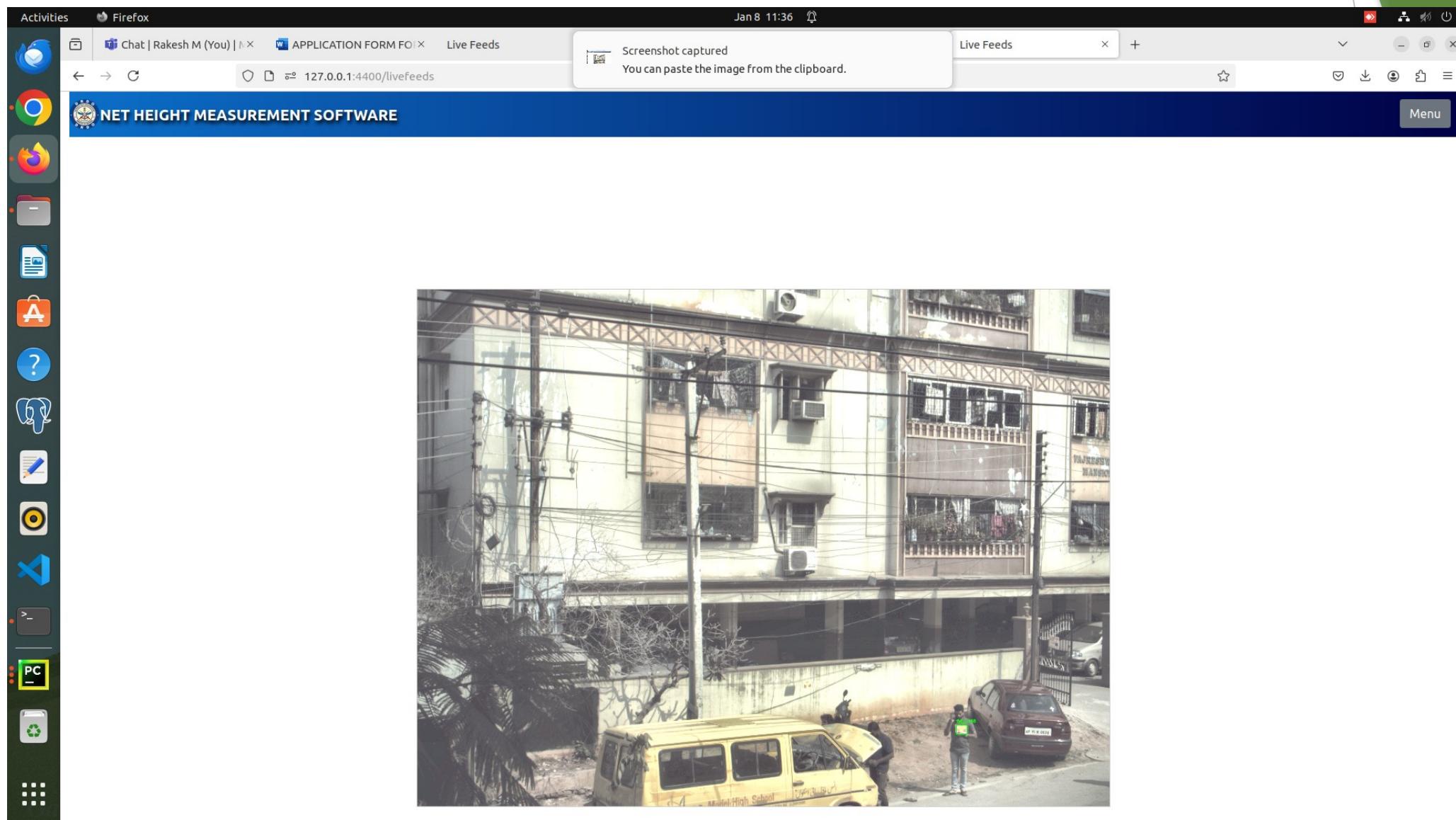
### 4. Improper exposure during day or night

**Failure Condition:** Frames are either too dark or too bright due to static exposure settings, reducing object detectability.

**Solution :**

- **Function Used:** exposure and gain.
- **Explanation:** Dynamically calibrates exposure and gain based on ambient light levels to maintain clarity across various lighting conditions.

## object detection in Sunlight



## 5. Motion blur in moving objects

**Failure Condition:** Fast-moving objects appear blurred, making detection unreliable.

**Solution :**

**Function Used:** motion deblur.

**Explanation:** Reduces motion blur by applying a deblurring algorithm that enhances the sharpness of moving objects.

## 6. Low visibility in foggy or rainy weather

**Failure Condition:** Weather conditions like fog or rain obscure the camera view, making object detection ineffective.

**Solution :**

**Filter Used:** defog.

**Explanation:** Enhances visibility by reducing haze or fog effects, improving contrast and clarity in challenging weather.

## 7. Rapid changes in lighting (e.g., entering tunnels)

**Failure Condition:** Sudden changes in light intensity result in either very dark or very bright frames.

**Solution :**

- **Function Used:** adaptive histogram equalization.
- **Explanation:** Equalizes the frame's brightness dynamically, ensuring consistent visibility despite rapid lighting changes.

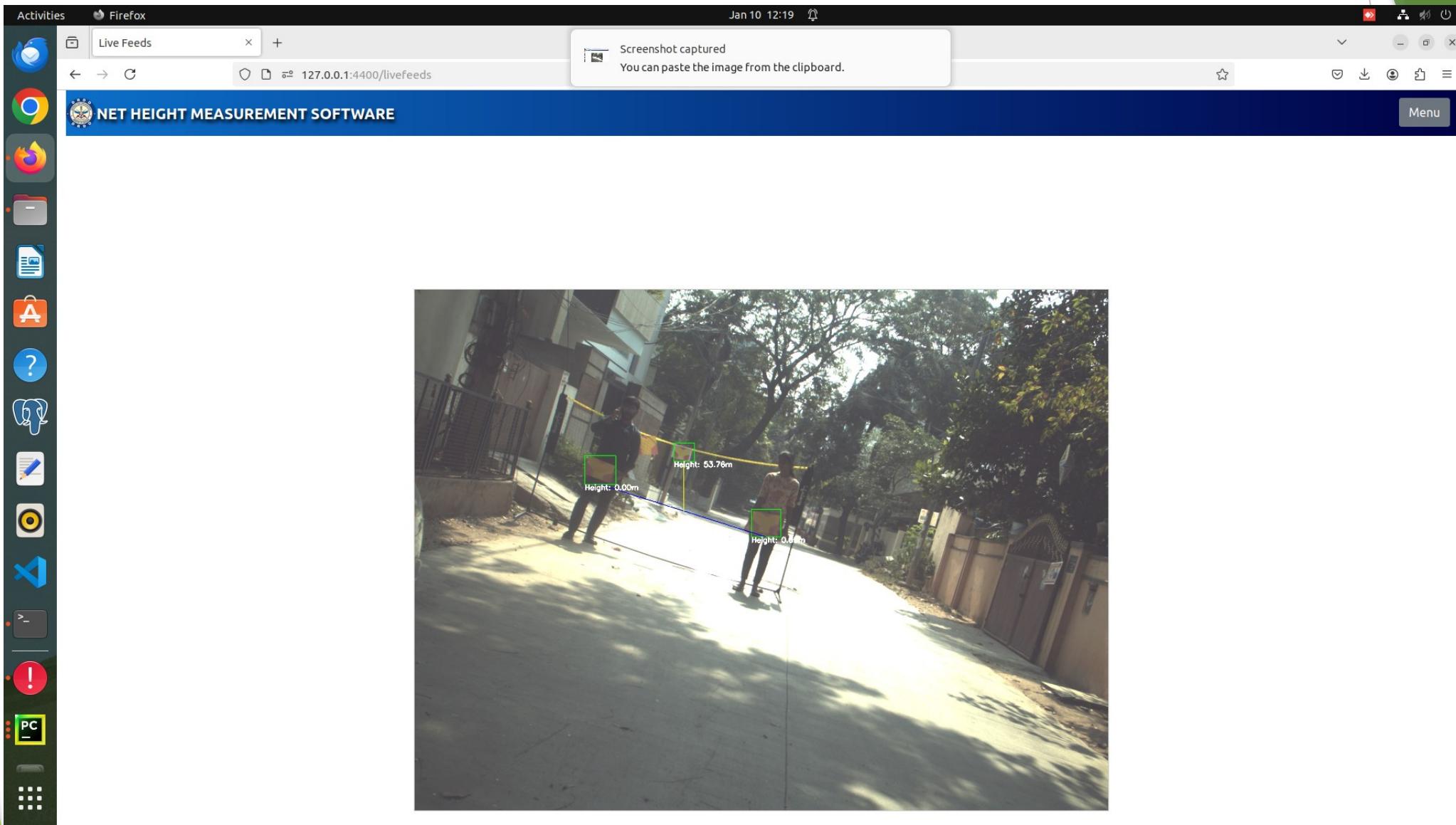
## 8. Frame drops during high motion scenes

**Failure Condition:** High-speed motion causes frame processing delays, resulting in dropped frames.

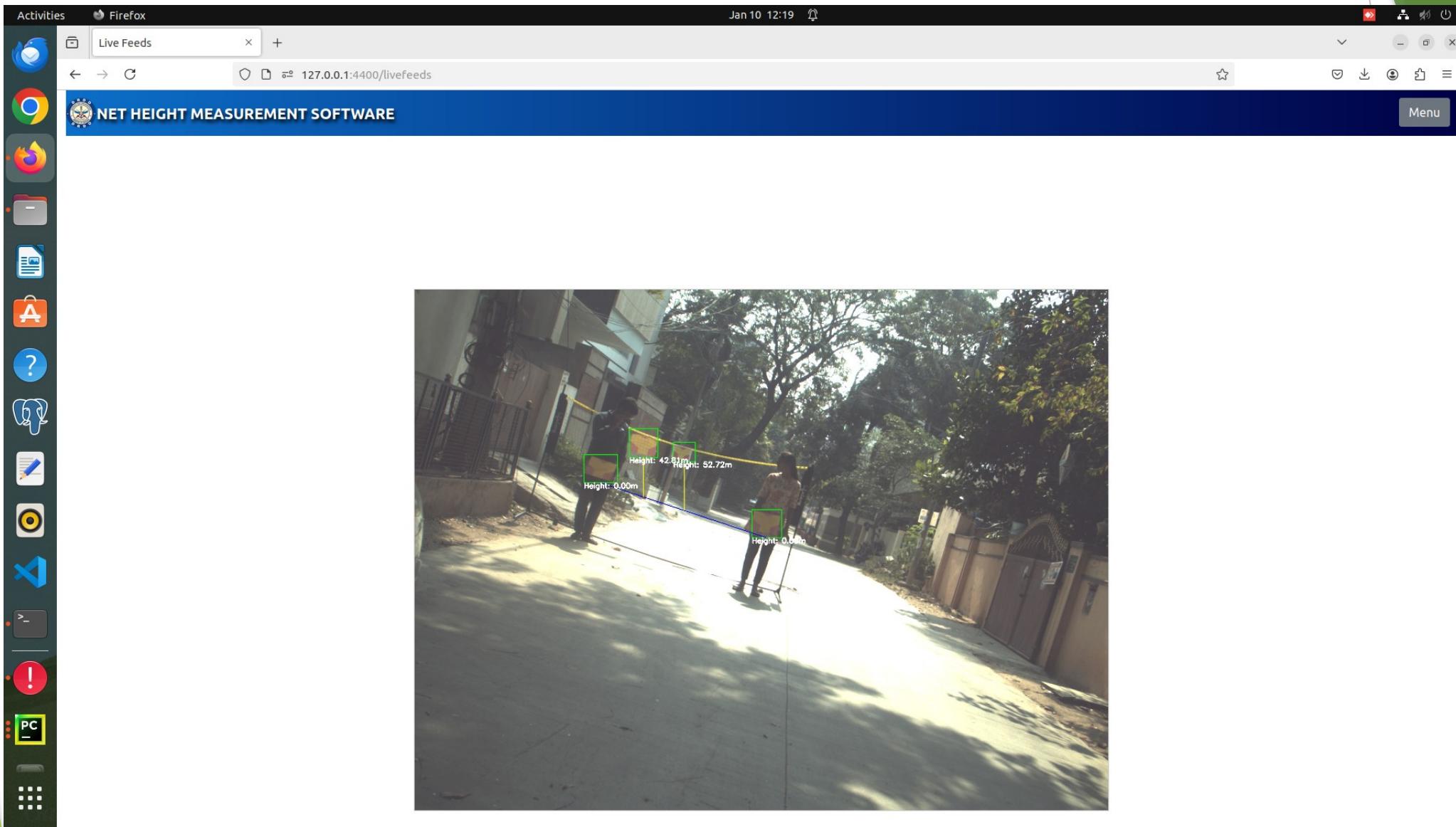
**Solution :**

- **Function Used:** frame buffering.
- **Explanation:** Optimizes frame capture and buffering to handle high-motion scenes without losing frames.

# Output



# Output



# Output

Activities    Google Chrome

Chat | Ganesh Kandikond x | Mail - Rakesh M - Outlook x | Live Feeds

Jan 8 18:34

Screenshot captured  
You can paste the image from the clipboard.

127.0.0.1:4400/livefeeds

NET HEIGHT MEASUREMENT SOFTWARE

Menu



A screenshot of a night scene captured by a software application titled "NET HEIGHT MEASUREMENT SOFTWARE". The image shows a multi-story building with multiple levels of windows and balconies. In front of the building, there is a parking area with several cars, including a prominent black car in the foreground. The scene is dimly lit, with most light coming from the building's own windows and some streetlights. A person is visible near the bottom right of the frame. The software interface includes a dark blue header bar with the title and a menu button. Above the main window, a message box says "Screenshot captured" and "You can paste the image from the clipboard." The browser tab shows the URL "127.0.0.1:4400/livefeeds".