



NightHawk POSE Detection & ID Mask Live Stream RTSP Videos

V 1.3

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1. Introduction

SDI will design & develop a [POSE detection production grade video processing solution that captures live stream RTSP videos](#), detects patient poses in real-time, and sends notifications to Healthcare Staff based on the detected poses. It will also anonymize individuals in a live stream video by masking their bodies in real-time. [This will connect seamlessly with the Admin portal and NightHawk Apps built by SDI.](#)

As part of this contract, SDI is prohibited from building a similar Pose Medical Patient Monitoring solution internally or for other entities for a period of 3 years after completion of this project.

2. Overview

This module will:

- Capture live video streams from RTSP sources.
- A listener that will trigger the processing of live stream videos for POSE Detection only when motion is detected and the Patient is not in a sleeping position.
- Process the video streams in real-time.
- Detect human poses using a trained AI/ML model.
- Anonymize individuals by masking their bodies
- Output pose data in a structured format.



3. Functional Requirements

3.1 Person Detection

3.1.1 Video Capture

- Input: RTSP live video streams.
- Output: Frames to be processed for pose detection.

3.1.2 Description

The system will detect a person in each frame of the live stream video.

3.1.2 Requirements

- We will use a human detection model (e.g., Haar cascades, HOG, or CNN).
- Detection will occur in real-time with minimal latency.

3.2 Pose Detection

3.2.1 Description

- Input: Video frames from the capture module.

SDI will implement a listener that triggers the processing of live stream videos for pose detection only when motion is detected and the user is not in a sleeping position. [The listener will also take into account the zoning area defined using the Label Me tool.](#)

- Processing: Apply a pre-trained pose detection model.



- The pose detection model will identify poses live-streamed from COTS cameras mounted at a ceiling height of approximately 8-20 feet, covering the field of view of a typical medical room. The pose detection will function effectively in various camera-mounting locations within the room. It will achieve nearly 85-90% (confidence score) accuracy in detecting falls from a straight line (plane) of detection and 95% (confidence score) from various side angles. After a period of time, a fallen person lying on the floor should be detected at approximately 95%(confidence score) regardless of the camera angle.

The pose detection will work in indoor settings in all light conditions with cameras equipped with adequate night vision Technology

- The Pose Detection model will identify the following Poses

- a. Fall Down
- b. Walking
- c. Standing
- d. Stand up
- e. Sitting
- f. In Bed
- g. Not in Room

- The pose detection model will provide a confidence score for each of its classifications, such as standing versus falling. The script will estimate the percentage confidence of the pose, infer the high score, and adjust accordingly.

- The pose detection model will include people counting to be able to select turning off Pose if more than 1 person is in a Room. This turning on/off of people counting is done in the ADMIN Portal

- Output: Pose keypoints data (coordinates of body parts).

3.2.2 Output Data

- Format: JSON or CSV.

- Content: Timestamp, key points coordinates, Pose type and confidence scores.

3.3 Masking of the detected Person



3.3.1 Description

Once the person is detected, the system will apply a mask (Blur) effect to each person(s) to obscure their identity. **The person will be masked at all times.** The system will receive an RTSP stream as input, process it to mask the person, and output the processed stream.

4. Technology Stack

4.1 Programming Languages

- Python

4.2 Libraries and Frameworks

- OpenCV: For video capture and frame handling.
- TensorFlow/PyTorch: For implementing and running pose detection models.
- FFmpeg, GStreamer Libraries: For handling RTSP streams, Dlib, FFmpeg, face-api.js
- Cloud Services: Amazon Rekognition

4.3 AI/ML Models

- OpenPose, PoseNet, or MediaPipe Pose.



5. Server Cost (Approximate Estimate) - 10 LIVE Streams

		Cost
1 GPU Instance	High-performance GPUs such as NVIDIA Tesla T4 or V100	Approx \$1.60 per hour
Disk Storage	500 GB	500 GB * \$0.17/GB = \$85
Estimated Cost	720 hours/month	2 * 720 hours * \$1.60 = \$2,304

6. Delivery Timelines

Programming, Testing and launch	4 months
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7. Investment Details

\$72,000 (US Dollars Seventy Two Thousand)

Tasks	Cost
Pose Detection	\$58,000
ID Masking	\$11,000
Night Vision/Grayscale/Color Programming	\$3000



8. Payment Terms

35% Upfront - \$24000

35% on completion of 50% of the project - \$24000

30% on completion prior to launch - \$24000

9. Inclusions

10 Site installations (1-100 cameras per location) (Remote or Onsite as needed). SDI will provide resources and assistance to configure and set up 10 customer locations for NightHawk (Travel, food and accommodation costs will be billed separately at actuals to NightHawk).

The actual physical installation of equipment will have to be done by electricians provided by the facility. Optionally SDI can send our electricians who will be trained in both hardware and software @\$100-\$150 per hour + Travel costs

Thank you

For Software Developers Inc

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