

# Contactless Respiratory Rate Monitoring Using Facial Video Analysis

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**Abstract:** This abstract proposes a contactless method for monitoring respiratory rate (RR) using facial video analysis, which overcomes the discomfort of traditional sensors for continuous monitoring in clinical and home settings.

**Keywords:** Contactless monitoring, Vital sign monitoring (or vital sign detection), Respiratory rate (RR), RGB camera, Optical flow algorithm, Skin segmentation, Filtering or noise reduction

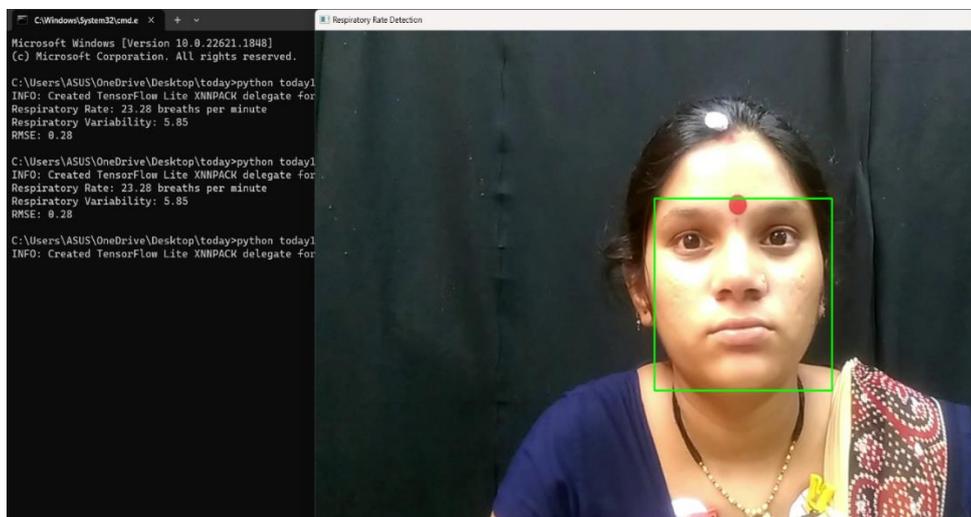
## I. INTRODUCTION

Contactless respiratory rate monitoring using facial video analysis is a non-intrusive method that extracts breathing rate from facial videos, offering a more comfortable and convenient alternative to traditional contact-based sensors. This approach analyzes subtle facial movements and color changes caused by breathing, such as those in the chin and chest regions, to estimate the respiratory rate without direct physical contact. This technology holds significant promise for applications in remote healthcare, neonatal monitoring, and sleep studies, where continuous and unobtrusive vital sign assessment is crucial.

## II. OBJECTIVE

The objective of this paper is to give the reader a better knowledge of :

- Automated Respiratory Monitoring.
- Non-Intrusive Measurement.
- Real-Time Monitoring and Interventions.
- Areas requiring more investigation and consideration.



## III MODEL DESIGN AND SELECTION

The contactless respiratory rate monitoring system via facial video analysis represents a significant advancement in the field of health monitoring. By utilizing computer vision and signal processing techniques, the proposed system offers a non-invasive, contactless method for estimating respiratory rates.

- **Front-End Technologies:** The user interface for the system is developed using HTML5, CSS3, and JavaScript. These technologies provide a flexible and responsive front-end that can be accessed via a web browser.
- **Back-End Technologies:** The system's back-end is built with PHP and MySQL Database. PHP is a widely used server-side scripting language, while MySQL provides a robust database management system for storing and retrieving data.

### Prerequisites

- Python: Used for computer vision and data analysis.
- OpenCV: For face detection and video processing.
  - NumPy and SciPy: For numerical and signal processing operations

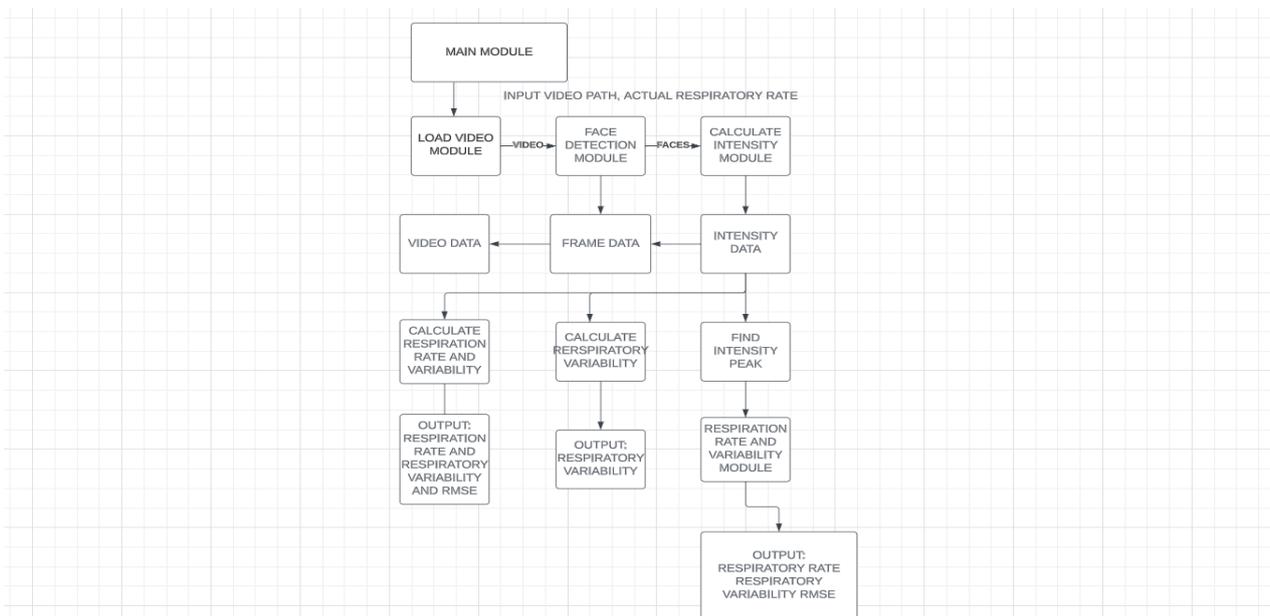


Fig. 1 Data Flow Diagram

### Table Specification

Patient_name	Data_type	Size	Constrain key
Patient_ID	INT	10	PRIMARY KEY
Patient_Name	VARCHAR	30	NOT NULL
Patient_Address	VARCHAR	200	NOT NULL
Patient_Email	VARCHAR	50	NOT NULL
Patient_Phone Number	INT	10	NOT NULL
Patient_Ordered_ID	INT	20	FOREGIN KEY

### IV. CONCLUSION

The contactless respiratory rate monitoring system via facial video analysis represents a significant advancement in the field of health monitoring. By utilizing computer vision and signal processing techniques, the proposed system offers a non-invasive, contactless method for estimating respiratory rates. This innovation addresses several limitations inherent in traditional contact-based methods, providing a safer, more flexible, and cost-effective approach.

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