

# Student Wellness Dashboard

*#Student Wellbeing*

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# Agenda

- **Our Team**
- **Introduction/ Need for Project**
- **Technologies Implemented**
  - **Dataset**
  - **Stress Prediction Model**
  - **Interactive Dashboard for Students and Parents**
- **Demo**
- **Technical Challenges & Solutions**
- **Future Considerations**

# Our Team



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# Introduction

## Problem Statement

- Increasing stress among students affects their mental health and academic performance.
- Lack of accessible tools for students, parents, and educators to monitor and manage stress effectively.

## Our Goal

- Develop a predictive model and a user-friendly dashboard for students and parents to provide actionable insights and recommendations on stress.



# The PEAS Framework

## Performance

- Accurate Predictions
- User feedback (Reduced stress level?, Dashboard interactivity?)

## Environment

- Dataset (The "Student Stress Factors" from Kaggle)
- Students accessing the virtual interface via web or mobile.

## Actuators

- Dashboard Notifications
- Personalized Suggestions
- Stress level predictor contributions

## Sensors

- Potential wearable integration. Heart rate, body temperature sensors
- User input
- Inputs from wearable devices.

# TECHNOLOGIES IMPLEMENTED

## Sensors

The implementation of sensors to collect data on patterns and behaviors would include:

**Blood Pressure Sensor** – To record possible spikes in stress due to study factors or behavior patterns

**PIR Sensors** – Passive Infrared Sensors (PIR) can be adapted to detect movement during sleep, and record restless.

**Emotion Recognition Camera Detection** – Using the camera from the students computer and OpenCV we can detect and record students emotion patterns.



# Dataset

Source – Kaggle

Psychological  
Factors

Anxiety level, Self-esteem, Mental health history, Depression

Physiological  
Factors

Headache, Blood pressure, Sleep quality, Breathing problem

Environmental  
Factors

Noise level, Living conditions, Safety, Basic needs

Stress Level: 0 – Low, 1 – Medium, 2 – High

# Feature Selection

- Methods Used:
  - ANOVA (Analysis of Variance)
  - Chi-Square Test
- Findings:
  - Both sleep quality and blood pressure showed the highest scores in the tests, indicating they are strongly correlated with student stress levels.



# Stress Prediction Model

- Model Selection:
  - Linear Regression:
    - Method used to predict a dependent variable's value based on its relationship with one or more independent variables, typically represented by a linear equation.
  - Random Forest:
    - Method that creates multiple decision trees during training and merges them to improve prediction accuracy.

# Comparing Models

## Linear Regressor

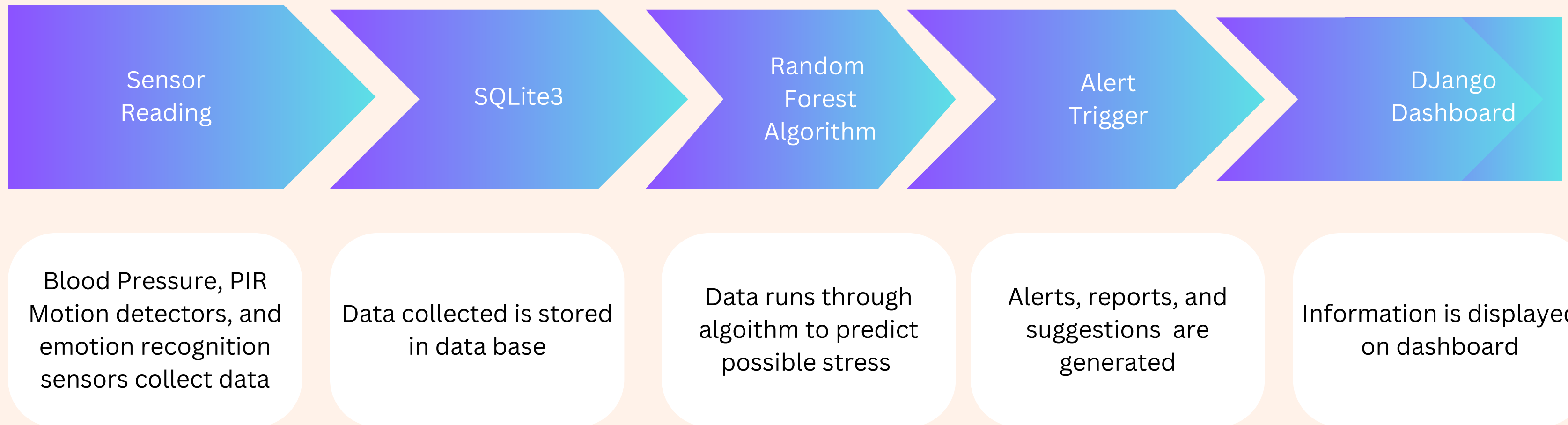
The Linear Regression model achieved an  $R^2$  value of 0.67.

**VS**

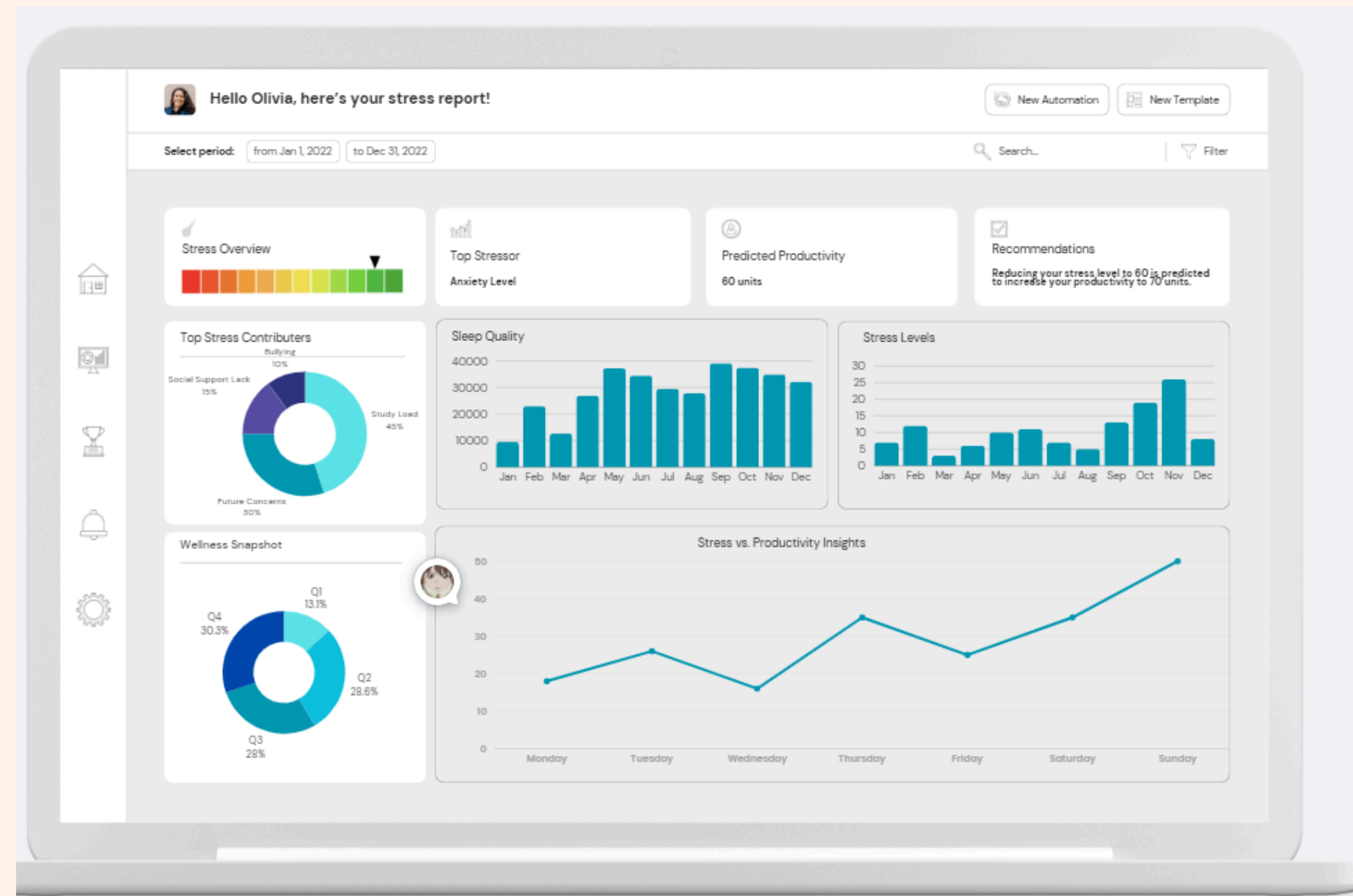
## Random Forest

The Random Forest Regressor delivered a stronger performance, with an  $R^2$  value of 0.82.

# PROCESS



# Dashboard

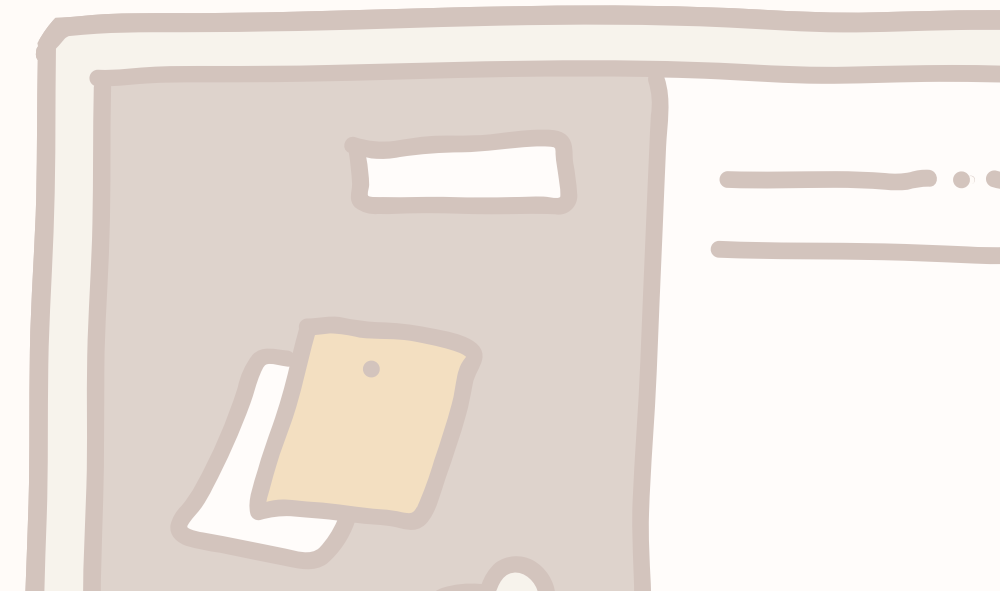


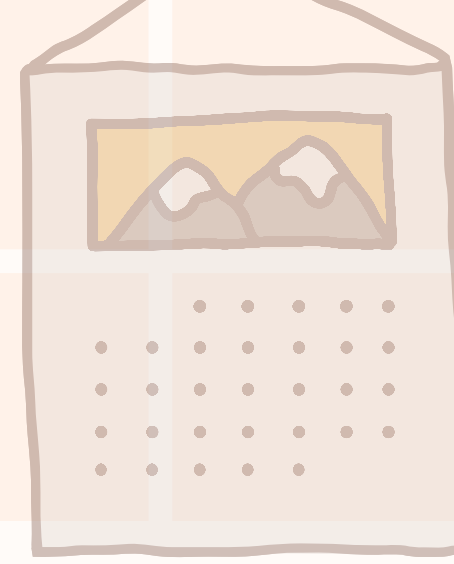
# Dashboard Features

- Monthly stress level and sleep quality statistics.
- Stress level vs. Productivity insights
- Factors contributing to stress level increase.
- Notification system for students and parents when stress levels are critically high, recommending immediate actions like
  1. Perform a 3–5 minute guided deep breathing exercise (e.g., inhale for 4 seconds, hold for 4 seconds, exhale for 6 seconds).
  2. A short physical break (stretching, walking, light yoga)
  3. Journaling
- For parents – Dashboard data to guide healthier habits, such as reducing screen time or maintaining a balanced routine.

# Technical Challenges

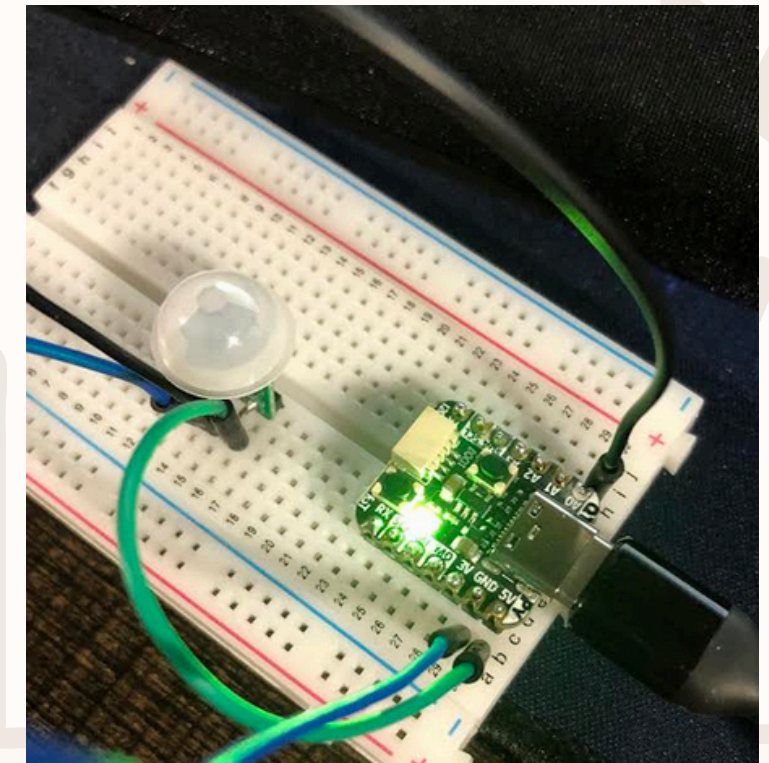
- Dataset size, limitations on accessing data due to sensitivity of the nature of data.
- Complexity in capturing real-time physiological or environmental data from sensors and integrating it with the dashboard.
- Combining and analyzing data from multiple sources (e.g., surveys, wearables, environmental sensors)





# Future Considerations

- Link dashboard access to academic institutions
- Integrating real time data collection using sensors.
- Recommender system for stress management activities.
- Personalize suggestions based on the user's stress history
- Further Gamification
- Trust-Building Features



Next goal is to adapt real-time PIR motion detector sensors

# The End



Thank You!

