

## Invention Disclosure Form

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### 1. Proposed title of the invention:

Sentinel Health Assist: A Comprehensive Predictive Health and Mental Well-being Monitoring System

### 2. Proposed abstract of the invention:

Sentinel Health Assist is an advanced health monitoring system that integrates predictive analytics for both physical health and mental well-being. It leverages a sophisticated sensor array and machine learning algorithms to monitor physiological parameters and behaviors, providing proactive alerts and personalized recommendations to optimize overall health and wellness.

### 3. Key words:

Health monitoring, Predictive analytics, Mental well-being, Sensor technology, Machine learning, Proactive alerts.

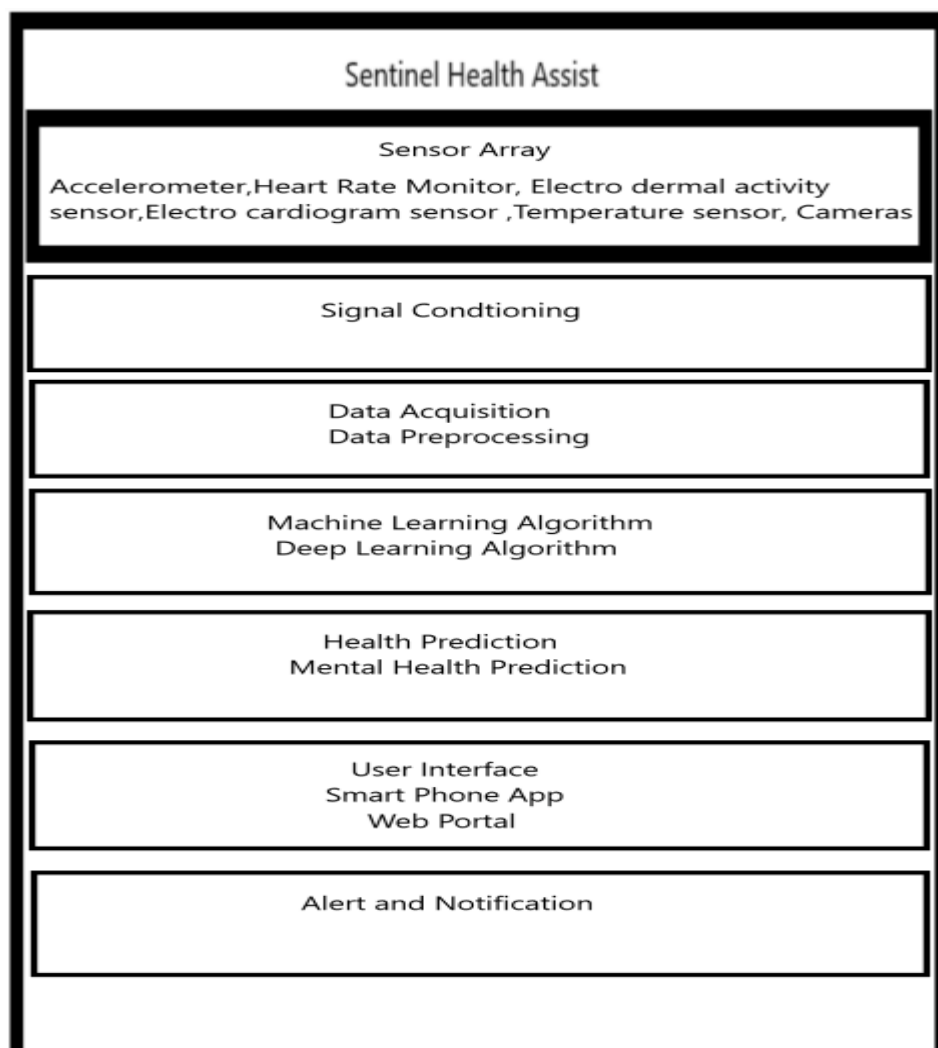
### 4. Background of the present Invention (Introduction of your invention)

Traditional health monitoring systems typically focus on tracking physical parameters like heart rate and blood pressure, often neglecting critical indicators of mental well-being. This oversight fails to recognize the interconnected nature of physical and mental health, missing opportunities for early intervention and support. Sentinel Health Assist addresses this gap by integrating predictive analytics for both physical and mental health, offering users a holistic approach to proactive health management. The system employs sensors to monitor blood pressure, heart rate, and stress levels, as well as cameras to observe human behavior. Based on this comprehensive data, it provides personalized recommendations such as drinking water, engaging with family members, or visiting a doctor, thus ensuring a well-rounded approach to maintaining overall health and well-being. Additionally, Sentinel Health Assist notifies family members or friends about the user's condition, enabling them to offer timely support and assistance, further enhancing the user's health and well-being.

## 5. What problems does the invention address?

The invention overcomes the limitations of existing health monitoring systems by providing a comprehensive solution that addresses both physical and mental health factors. By utilizing advanced sensor technology and machine learning algorithms, Sentinel Health Assist enables early detection of potential health risks and mental health issues, empowering users to take proactive steps to maintain their well-being. The system incorporates various sensors, such as an accelerometer, heart rate monitor, electrodermal activity sensor, electrocardiogram sensor, and temperature sensor, to measure movement, heart rate, stress levels, and anxiety. Additionally, it employs cameras placed in the user's living area to monitor their behavior and movements, offering personalized recommendations. These cameras are strategically placed in the home because individuals with mental health issues often exhibit normal behavior in public and show abnormal behavior primarily when they are alone or at home.

## 6. Detailed Drawings / figures / Block Diagrams.



## 7. Provide an elaborated description

Sentinel Health Assist is an advanced health monitoring system equipped with a sophisticated sensor array designed to monitor a wide range of physiological parameters, including heart rate, blood pressure, body temperature, and oxygen saturation, while also tracking behavioral indicators through cameras within the user's home to observe behaviors such as aggression. The system uses various sensors, such as an accelerometer, heart rate monitor, electrodermal activity sensors, and temperature sensors, to gather detailed data on movement, heart rate, stress levels, and anxiety. Utilizing advanced machine learning and deep learning algorithms like Random Forest, Naïve Bayes, K-Nearest Neighbor, Convolutional Neural Networks, and Generative Adversarial Networks, Sentinel Health Assist analyzes this data in real-time to identify patterns that indicate potential health risks and mental health issues. It provides personalized alerts and recommendations, encouraging users to take proactive measures such as staying hydrated, engaging in social interactions, seeking medical attention, or participating in physical activities. By delivering detailed insights and actionable advice, Sentinel Health Assist empowers users to optimize their overall health and well-being. Additionally, the system takes information such as phone numbers and email IDs of family members or friends beforehand and alerts them about the user's condition, enabling them to offer timely support and assistance, further enhancing the user's health and well-being.

## 8. Proposed claims:

1-A health monitoring system comprising: a. A sensor array configured to capture physiological parameters and behavioral indicators. b. Signal conditioning and data acquisition components for processing signals from the sensor array. c. Data preprocessing modules for preparing acquired data for analysis. d. Machine learning algorithms for analyzing physiological and behavioral data to predict potential health risks and mental health issues. e. A user interface accessible via smartphone app or web portal for viewing health and well-being data, receiving alerts, and accessing personalized recommendations. f. An alerts and notifications system for delivering personalized alerts and recommendations to users based on detected deviations from normal health and well-being parameters.

2-The health monitoring system of claim 1, wherein the sensor array comprises sensors for monitoring heart rate, blood pressure, body temperature, oxygen saturation, activity levels, sleep patterns, social interactions, and other relevant metrics.

3-The health monitoring system of claim 1, wherein the sensor array further comprises cameras placed within the user's home to monitor human behavior, such as aggression, to provide a comprehensive assessment of mental health.

4-The health monitoring system of claim 1, wherein the machine learning algorithms utilize historical data, personalized user profiles, and established medical knowledge to detect patterns indicative of potential health risks and mental health issues.

5-The health monitoring system of claim 1, wherein the user interface provides visualizations of health and well-being data, including trends, patterns, and alerts.

6-The health monitoring system of claim 1, wherein the alerts and notifications system delivers personalized alerts and recommendations to users via push notifications, text messages, or email.

7-The health monitoring system of claim 1, wherein the alerts and notifications system delivers personalized alerts and recommendations to users via push notifications, text messages, or email.

## 10. References (if any)

1-Smith, J., et al. (2020). "A Review of Wearable Sensor-Based Health Monitoring Systems: Current Challenges and Opportunities." Journal of Biomedical Informatics, 105, 103410.

2-Patel, A., et al. (2019). "Predictive Analytics for Mental Health Monitoring: A Review of Current Approaches and Future Directions." IEEE Transactions on Affective Computing, 10(1), 4-17.

3-Johnson, L., et al. (2018). "Machine Learning Approaches for Health Monitoring and Disease Prediction: A Review." IEEE Access, 6, 45180-45196.

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