

**IDEA: A Device for the Detection and Reliable Capturing of the Pulse Characteristics and Hence predicting the diseases in the early stage: Add this feature to smart watches.**

**Requirements:** 1. Pulse portable detection unit comprises at least three pressure sensors configured to provide an air gap between the sensors and the pulsating substrate to sense the pulse at the vata, pitta and kapha locations on the wrist of a subject.

2. Accelerometer system

3. A controller for controlled acquisition of signals by the said pressure sensors and said accelerometer system

4. The powered base unit operable connected to the storage unit selected from a communication device, a computer or a cloud based storage.

5. A temperature sensor for recording the temperature of the subject, a camera to photograph the subject, a microphone to record the voice of the subject, and combinations thereof are provided in the pulse portable unit or in the base unit.

**Processing of Existing under research System:** A process of recording of the pulse signals at the vata, pitta and kapha locations on the wrist of a subject using device of claim comprises following steps:

1. switching ON the base unit

2. inputting the medical information of the subject in the storage system

3. optionally capturing the subject's photo and storing in the storage system

4. resting the subject's hand (s) on the "wrist-rester"

5. gripping the subject's wrist(s) by the investigator by placing his thumb in the gap provided in base unit.

6. sensing the pulse using three fingers of the investigator placed in the slot of portable unit and positioning the portable unit on the wrist's region of the subject

7. acquiring the signals from the pressure sensors, accelerometer, optional temperature sensor in local memory of the base unit and storing the data for further analysis

8. optionally recording the subject's voice and storing in the storage system

9. switching OFF the base unit after the data acquisition

Pulse Signal Measuring Portable Unit

**My Proposed System:** Adding all these features to smart watch

1. **Add the sensors at the ends of the watch.** Now for **sensors location checking at exact position or not:** In the display of watch, keep notifying until sensors fit at correct position and start getting the reading. Now supply this data through Bluetooth as usual smart watches do to the system, which through internet will be **stored in a central database.**

2. **Add a camera and voice recorder/microphone** to the watch to capture face of person and his voice as they are a part of predicting the disease and other functionalities accurately.

3. **Create a centralized database** with these measures, pulses, face, voice combination and connected diseases with all these combinations under the supervision of expert ayurvedic doctors (I am taking guidance for this project since last two years).

4. **Now apply medical image processing techniques,** matching the pulses obtained of any person with the stored database.

5. Keep updating the database.

6. **Apply various machine learning techniques** to improve the system performance with the increasing data collection.

7. **Apply Convolutional neural network (CNN)** to make the system intelligent and predict diseases faster.

8. Now, reply to the person bearing the watch about his health status and precaution and remedies.

9. If he/she is suffering from some disease:

**Show the nearest hospital/consultant**

Nearest Medical shops

Also, the **medicines** that he/he can take immediately.

If any other thing possible to give instant relief.

**Challenges:** **High accuracy required:** Until we obtain a large accurate training data, we can't make our system prediction very accurate. So, for the gaining the users belief, high accuracy is needed.

Even **better machine learning methodologies** are needed that can train system faster and achieve accurate predictions in future. Even it can lead to **elimination of need of camera and voice recorders/microphone**

Pulse Signal Measuring Portable Unit

**My Proposed System:** Adding all these features to smart watch

1. **Add the sensors at the ends of the watch.** Now for **sensors location checking at exact position or not**: In the display of watch, keep notifying until sensors fit at correct position and start getting the reading. Now supply this data through Bluetooth as usual smart watches do to the system, which through internet will be **stored in a central database**.
2. **Add a camera and voice recorder/microphone** to the watch to capture face of person and his voice as they are a part of predicting the disease and other functionalities accurately.
3. **Create a centralized database** with these measures, pulses, face, voice combination and connected diseases with all these combinations under the supervision of expert ayurvedic doctors (I am taking guidance for this project since last two years).
4. **Now apply medical image processing techniques**, matching the pulses obtained of any person with the stored database.
5. Keep updating the database.
6. **Apply various machine learning techniques** to improve the system performance with the increasing data collection.
7. **Apply Convolutional neural network (CNN)** to make the system intelligent and predict diseases faster.
8. Now, reply to the person bearing the watch about his health status and precaution and remedies.
9. If he/she is suffering from some disease:  
**Show the nearest hospital/consultant**  
Nearest Medical shops  
Also, the **medicines** that he/he can take immediately.  
If any other thing possible to give instant relief.

**Challenges:** **High accuracy required**: Until we obtain a large accurate training data, we can't make our system prediction very accurate. So, for the gaining the users belief, high accuracy is needed.

Even **better machine learning methodologies** are needed that can train system faster and achieve accurate predictions in future. Even it can lead to **elimination of need of camera and voice recorders/microphone**