Automatic Air-filter maintainence through Android app

Abstract

Using raspberry pi, we can sense the amount of dust particles present in the air filter, if this amount increases beyond a particular limit, then, it is informed to the user through an android app.

Introduction

Air filter is commonly used in Air conditioners, Air coolers and Air pollution controllers. In traditional systems, users have to monitor this filter periodically and service it. By using the ‘Internet Of Things’ technology, this burden can be avoided.

Requirements

- Sensor
- Raspberry pi-3 (with inbuilt Wi-Fi)
- Smartphone with app installed

Hardware Design

The amount of dust in the filter can be sensed by either a pressure sensor or load sensor.

If we use load sensor, the weight of the clean filter (without any dust) is pre-determined, and later the difference between the sensed value and clean filter's weight is calculated. Depending on this value, if it is above the permissible limit, the information is passed to cloud.

If we use pressure sensor, a couple of sensors are used one before the filter and one after the filter. The pressure of air is sensed on either end of the filter. Then the difference between these values is calculated. If the dust level is high then pressure at the back end of the filter will be less. As a result the difference also increases. By using this value, the dust level can be predicted.

Software Design

The software design of this project is mainly focused on linking the data collected from the sensors (pressure sensor or load sensor) which are going to be used to sense the dust levels to the cloud through raspberry-pi 3.

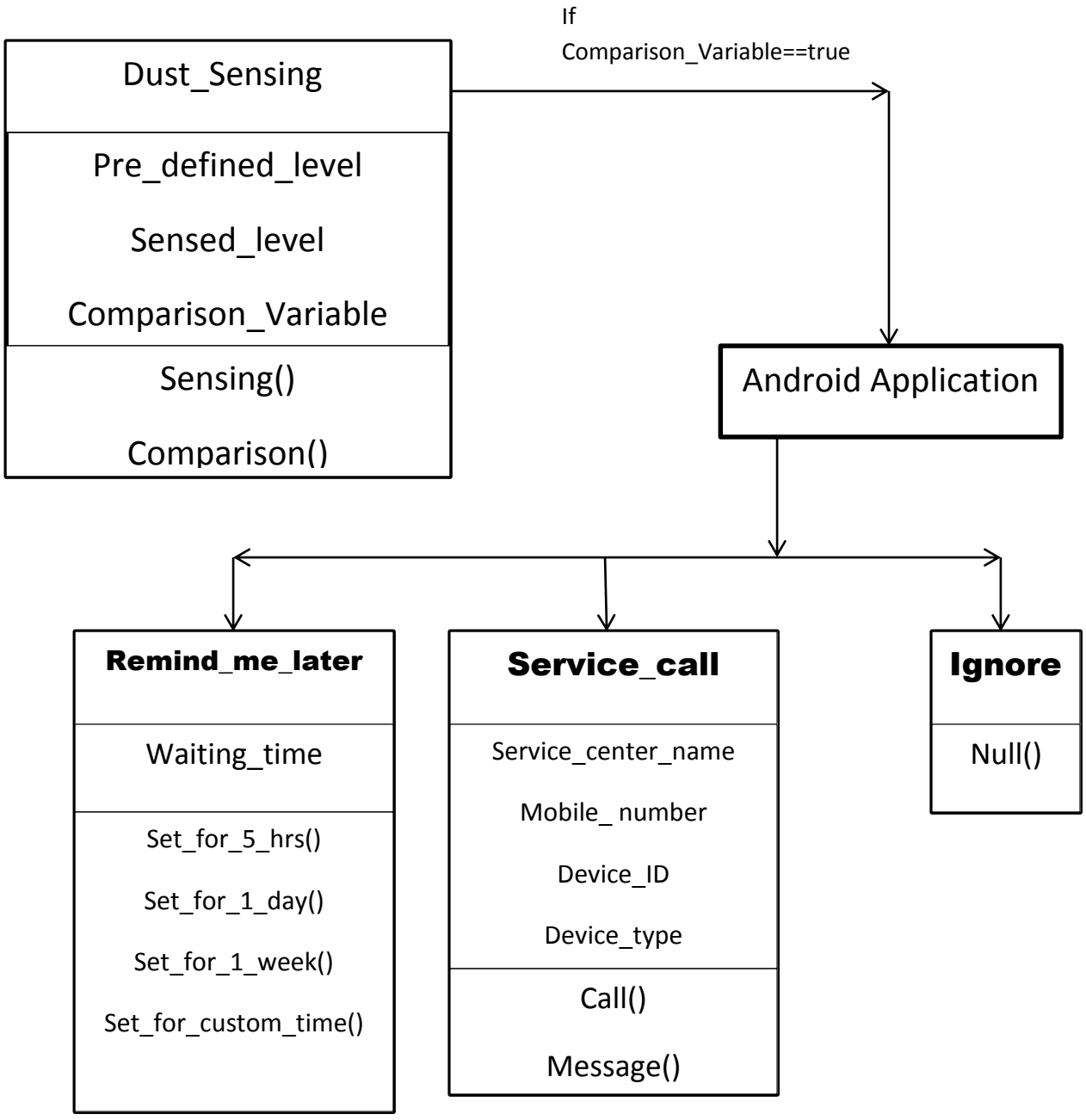
The data is then processed in the cloud to find out whether dust levels in the air filter are within permissible limits or has exceeded the permissible limits.

If the dust levels have exceeded the permissible limits, then the information from the cloud is then transmitted to the user's smart phone via an android app that the dust levels have exceeded permissible limits.

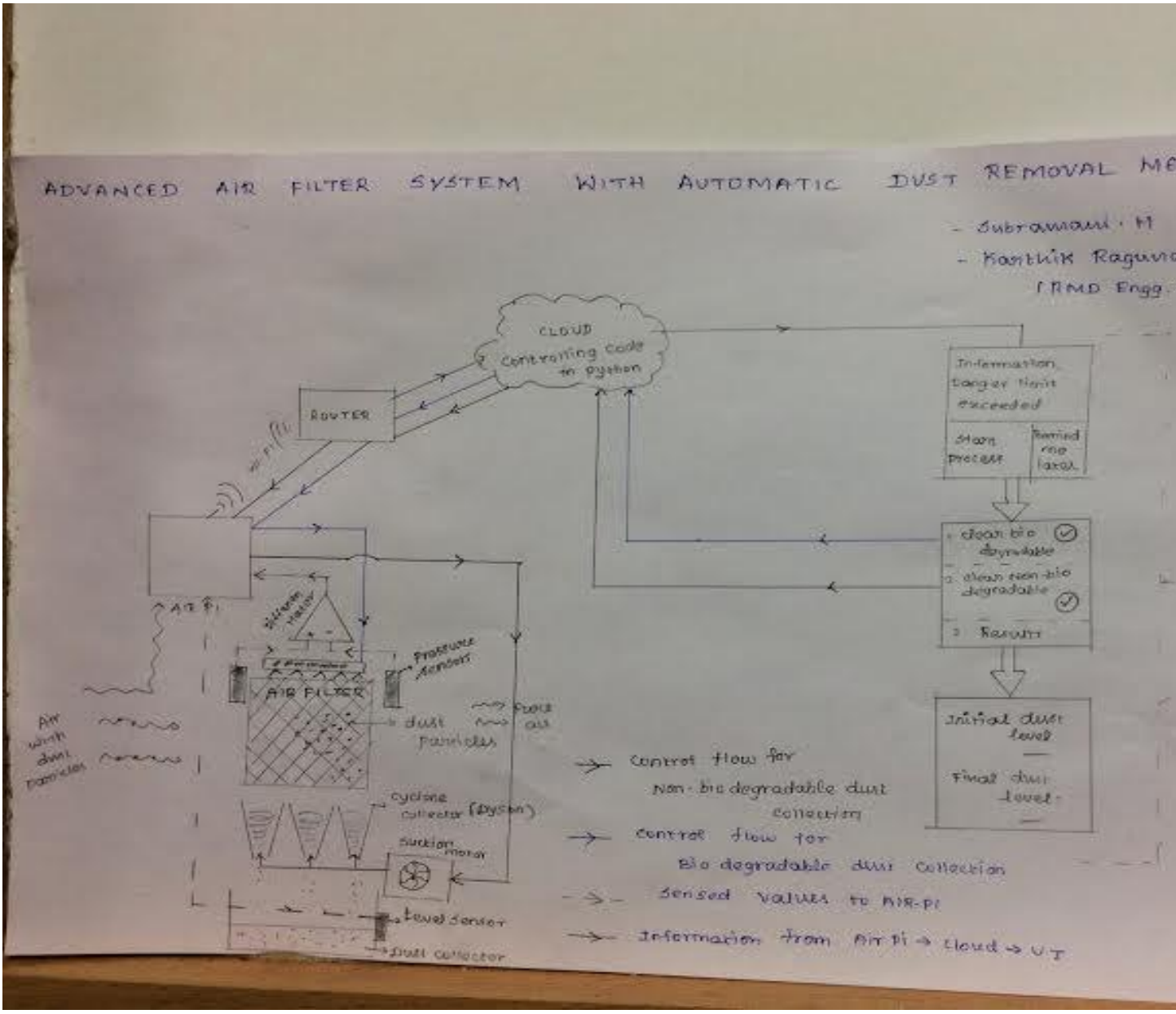
Now, user can take any of the three possible courses of action through the android app:

- Ignore the warning
- Set a time to remind about it later
- Take immediate action, i.e., to call or message service center.

CLASS DIAGRAM



Prototype image:



Conclusion

Thus by implementing this project, we hope to bring about a change in the mechanism used for maintenance of air filters used in various electrical machines.