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Towards Developing a Health Monitoring System of a Pilot using IoT Wrist band.

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***Abstract*— Now-a-days accident of aircraft or aero-plane has become very common. Again many of them are occurring due to lack of mental or physical stability of the pilot. A pilots health is examined before the flight. But it is not examined during the flight. So, here comes a requirement of checking the health state of the pilot during the flight. Thus the objective of this project and research is to develop such a system to ensure more safety to the pilot and other valuables. Present smart wrist watches can do the same work but those cannot be used for a pilot because of its operation environment. So, our system is completely new in the dimension of Airforce and it is more effective.**

***Index Terms*—Automation, IoT, firebase, MIT app inventor, various sensors, Arduino, RF communication.**

1. Introduction

The name of our project is “Health Monitoring System of a Pilot Using IoT Wrist Band”. Our project includes a digital wristband, an ATC base and a mobile app. In this project, data analysis will be done by taking reading from the smart wristband of the pilot. By analyzing the data, signal will be given based on the health condition of pilot flying the aircraft. There will be given standard readings comparing with which analysis will be done to generate necessary alert for the pilot. Physician sitting in the ATC base can also provide necessary health advice to

the pilot using the default communication method for aircraft. The purpose of out project is:

a. To know the physical condition of a pilot during flight.
b. To minimize the risk of the life of a pilot and thereby the passengers.
c. To save the aircraft and other valuables.

The project will be made initially for the GDP pilots of Bangladesh Airforce. Registered pilots and officers at ATC base will have the access to use it. Authorized officer from the unit or training institution will have the authorization to access the information. Then this product will also be open for all the private civil pilot and other organization related to pilot. Our main focus will be accuracy of data and its proper analysis and quick reaction by ATC base controller. The scope of the product is totally based on Pilot health status.

2. Related Works

Presently, there are smart watches which are able to find out the readings of different factors available for human health state. And the data remains confined with in that device. There is no central data analysis process.

Our aim is to make the system more robust, allowing it to transmit data from flying aircraft to the base and analyze the data with the standard one. So that we can advice the pilot according to the situation. Currently there are no system which is identical to ”Health Monitoring of a pilot using IoT wristband”. However, there are some projects which matches with some part of this system but not during flying situation and there is no system of monitoring. The main part of this system is to communicate with ATC tower reading sensor values . Previously, there was no system of monitoring pilot’s health during flying.Before flying they were checked by flight surgeon.If they were fit for flying,then they were allowed to fly. Software based health monitoring is still an unexplored research area. There are different apps like HealthTap,Shopwell:Better Food Choices,Elevate: Brain Training,Fabulous: health care etc for health care purspose.But they are not related to flying and only individual can check their health status.But in our system for the first time pilots have to register and create an account. This account includes specific information about the pilot . An administrator is responsible for assigning

pilot. The account is stored in the system database and it is associated with a unique ID that is the same as the ID of the band assigned to the specified pilot.When a pilot registerd ,then through sensors his health status is send through rf to ATC tower,In ATC tower admin can see the health condition of that particular pilot assigned to the band. There are standard readings of sensors .By comparing with those datas pilot's health is monitored.

Fig 1: Proposed Health Monitoring of a pilot using IoT Wristband

3. Design and Implementation

This system requires app-based system for readin sensor datas.There is a LED placed at ATC tower which will show the values from wristband.Data

will be stored in firebase. Admin can see the health status of the pilot through the app and act accordingly.

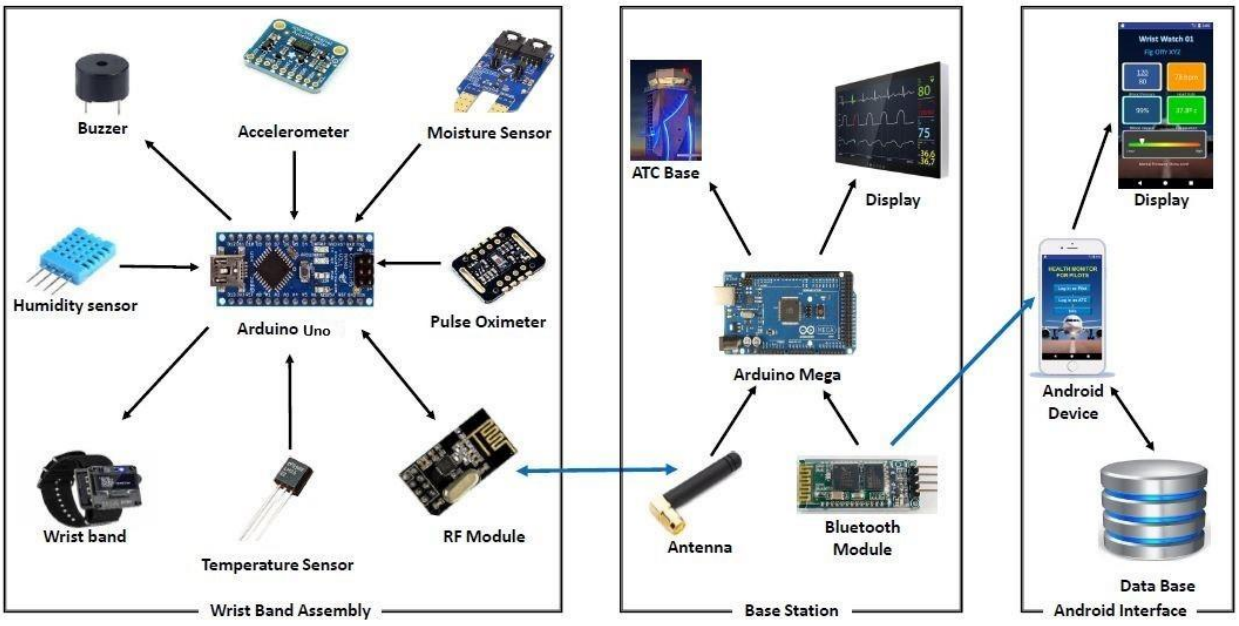

Fig: System Architecture

Fig: System Architecture of Health Monitoring of a Pilot Using IoT Wristband

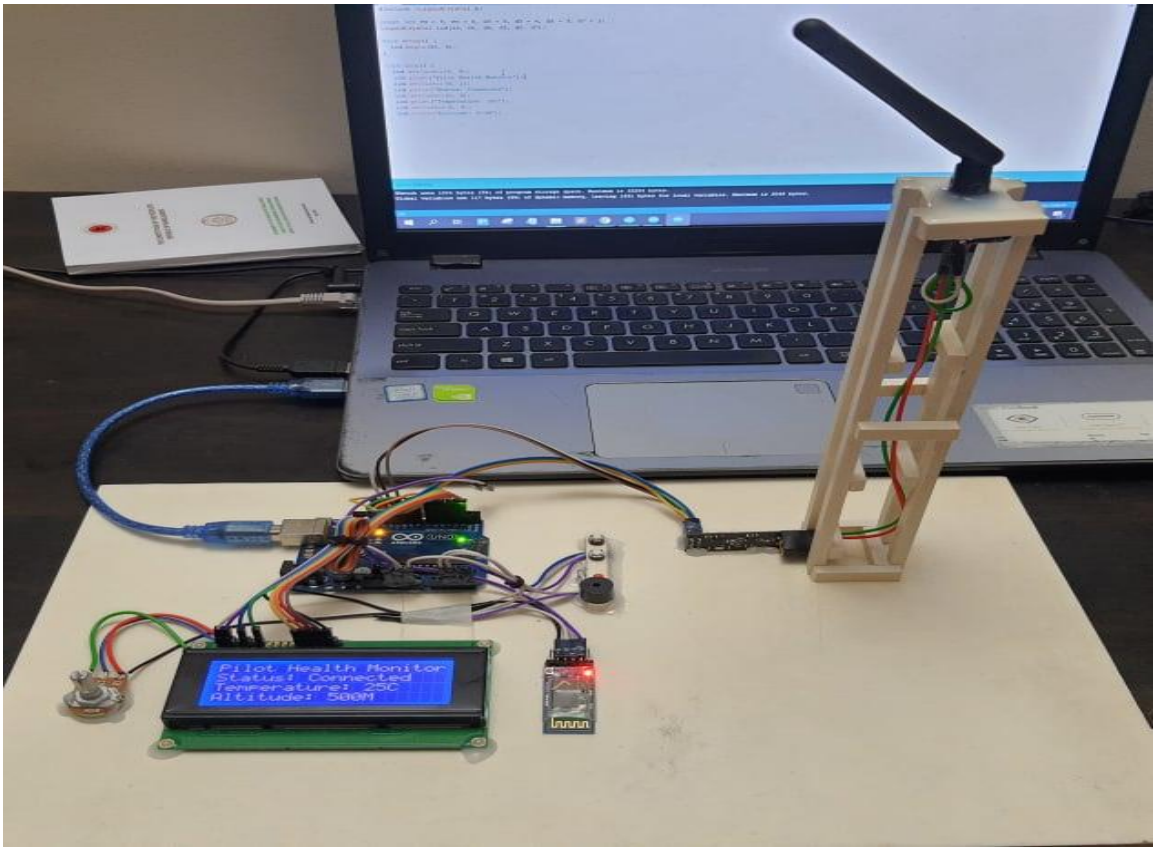

Fig: Implementation of Health Monitoring of a Pilot

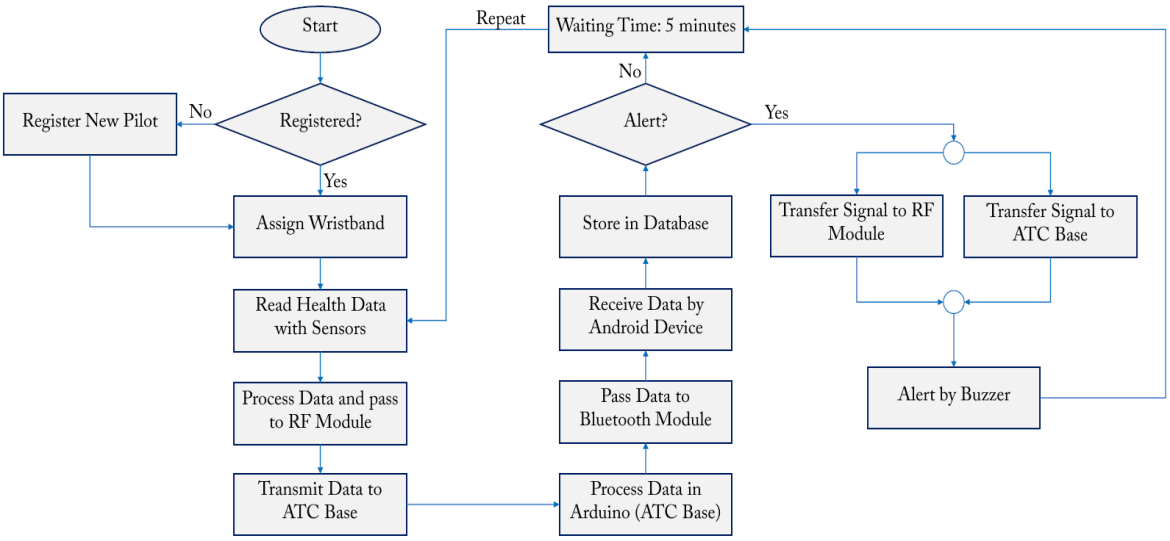

Figure: Work Flow Diagram of Health Monitoring System of Pilot

According to the workflow diagram if pilot is registerd then wristband has to be assigned for that particular pilot. From wristband health data will be read by sensors attached with the wristband. These data will be processed and pass to ATC tower through RF module. In ATC base ,data will be processed in Arduino and it will be passed to App by Bluetooth module. The data will be stored in database.Air Traffic Controller or Authorized personnel will only be able to monitor pilot's health.By comparing with the standard values, if critical condition occurs there will be an alert system in wristband which will alert the pilot about critical condition.

4. References

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