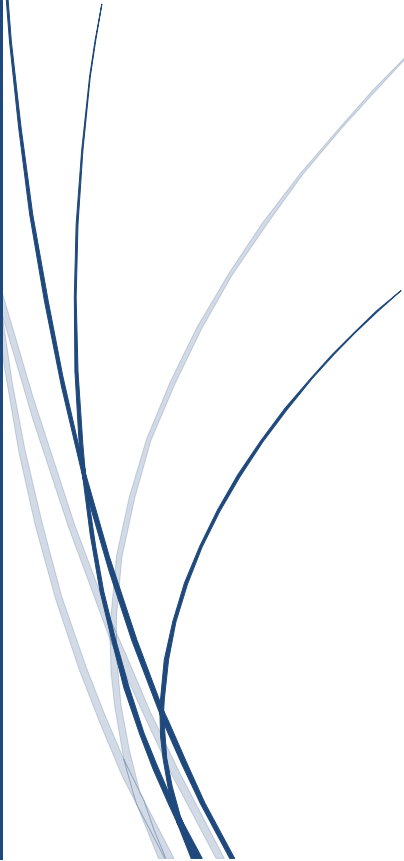8/19/2020

Project Proposal
Group:Echo
Sec:A
Group Members:

1.Major Rezoan(201814002)
2.Lt Anidya(201714111)
3.Flg Offr Nafiun(201814011)
4.Offr Cdt Arnob(201814010)
5.Offr Cdt Khan(201814012)

MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
PROJECT PROPOSAL OF IDP

1. **Group No: Echo**   **Date**: 19.08.2020
2. **Section:** A   **Session**:   2017-18
3. **Program: CSE-18**

4. **Tentative Title**. Health Monitoring of Pilot using IoT Wristband.

5. **Background and Present State of the Problem**.   A pilot is medically examined before his flight by a medical personnel. But during his flight in the air, his physical and mental condition may vary basing on different situations. A complete monitoring system may come in use to determine the health condition of a pilot throughout his travel duration. Our project idea is based on the required solution to this problem. It includes a digital wristband and a mobile app. Data analysis will be done by taking reading from the smart bracelet 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 based on which normal, slight abnormal, moderate abnormal and acute abnormal condition will be checked and necessary signals will be given to the pilot to take necessary actions. For emergency cases online health officials will be connected for better recovery.


6. **Objectives with Specific Aims and Possible Outcome**.
   a. To know the physical condition of a pilot during flight.
   b. To minimize the life hazard of a pilot during his flight and thereby the passengers.
   c. To save the aircraft.

7. **Outline of Methodology/Experimental Design**.

   a. **Heart Rate Sensor**.   An optical blood flow sensor will be integrated from which heart rate can be checked.
   b. **Ambient Temperature Sensor**. Ambient temperature could be compared to skin temperature in the service of determining exertion levels.
   c. **Accelerometer.** Accelerometer measures body movement to track the pilot's movement pattern.
   d. **Baromete**r. Barometer can measure changes in altitude, which is relevant to sudden fall or crash of aircraft.
   e. **Pulse Oximeter.** This sensor measures blood oxygen, a key data point for reporting accurate pulse rates and health status of pilot.
   f. **Fire Sensor**: CO & CO2 level and air quality sensor determines their quantity in air and determines if there is any smoke or fire in cockpit.

Health Monitoring of Pilot using IoT Wristband
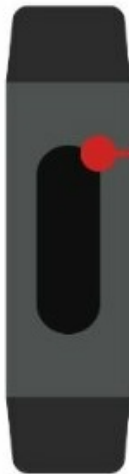
INPUT UNITS:
1. Heart Rate Sensor
2. Ambient Temperature Sensor
3. Accelerometer
4. Barometer
5. Pulse Oximeter
6. Fire sensor

CPU:
ATmega328 AVR Microprocessor

MICROCONTROLLER BOARD:
Arduino UNO

COMMUNICATION:
RF 433 MHz Transmitter

POWER:
3.7V 500mAh Lithium Polymer Cell

CPU:
ATmega2560 AVR Microprocessor

MICROCONTROLLER BOARD:
Arduino MEGA 2560

COMMUNICATION:
RF 433 MHz Receiver

EJECT CONTROLLER:
5V Relay Switch

POWER:
On Board Power from Aircraft

Eject Control Box

8. **Covered Domain Covered in our Project.**

☐Theoretical CS and Algorithms	☒Information Security
☒Networking	☐Computer Vision
☐Database and Data Mining	☒Pattern Recognition
☐Cloud Computing and Big Data	☒Internet of Things (IoT)
☐AI and Robotics	☒Human Computer Interactions (HCI)

9. **References**.

   a. Shirin Enshaeifar, May 3, 2018, *Health management and pattern analysis of daily living activities of people with dementia using in-home sensors and machine learning techniques* (https://journals.plos.org/plosone/article? id=10.1371%2Fjournal.pone.0195605&fbclid= IwAR029lkTqz27drbQqU7NxshKKUFiihQi1kVjUBscggR6VRk5OhMajUBAr9s).

10. **Cost Estimate**.

Ser No	Items	Cost (Taka)
1.	Cost of Equipment	16000/=
2.	Field works	3000/=
3.	Conveyance / Data Collection	2000/=
4.	Typing, Drafting, Binding and Paper etc.	200/=
Total Amount		21200/=

11. **Cost Estimation of the Individual Products.**

Ser No	Name of the item	Cost(Taka)
1.	Accelerometer	1200/=
2.	Ambient Temperature Sensor	700/=
3.	Heart rate Sensor	1700/=
4.	Barometer	1700/=
5.	Pulse Oximeter	1200/=
6.	Fire Sensor	900/=
7.	Arduino Uno	450/=
8.	RF 433 MHz Transmitter	4000/=
9.	AT mega 328 Microprocessor	1000/=
10.	3.7V 500 mAh Lithium Polymer Cell	300/=
11.	5 V Relay Switch	30/=

12. **Market Analysis**. (Following is the market analysis with other existing project)

Existing Projects VS Our Project	Heart Rate Sensor	Ambient Temperature Sensor	Acceler ometer	Barometer	Pulse Oximeter	Fire Sensor
Xiaomi Mi smart band	√	X	√	√	X	X
Heart Rate Activity Tracker Band-H115	√	X	X	X	X	X
M2 Waterproof Smart Fitness band	√	X	X	X	X	X
Apple Watch S5 40 mm	√	X	√	√	X	X
Our Project	√	√	√	√	√	√

13. **Signature of the Group Members**.

Serial No	Student ID	Name	Email	Signature
1.	201814002	Maj Md Rezoanul Hafiz Chandan	mrhchandan@gmail.com	
2.	201814011	Flg Offr Nafiun Nahar Polok	nafiunpolok@gmail.com	
3.	201714111	Lt Anidya Mostofa	anindya.mostofa@gmail.com	
4.	201814010	Offr Cdt Asif Shahriar Arnob	arnobsmail@gmail.com	
5.	201814012	Offr Cdt Raiyan Khan	ryankhankayoger@gmail.com	

…………………………….
Signature of the Course Teachers