Angst Management Technology

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***Abstract* - Now a day's people are intolerable to their senses and feelings. There are n number of categories in feelings they even differs according to each and every person personality and character .One among these feelings is Anxiety caused by Adrenaline Hormone ,which can creates worst scenarios on lacking control over it by respective person. In general for a person it starts with very small conversation and leads to intolerable cruel .So this is the main cause of disputes .The remedy for this is to control himself when the level of Adrenaline is reaching a person's threshold of losing his temper. Controlling himself could be quite tough task during that situation so this AMT (Angst Management Technology) will alarm him "that you are going intolerable". AMT works on sensory recognition which can recognize through mainly 5 sensors .They are Facial Image Processing, Pulse rate, Heartbeat, Spinal senses, Voice. These sensors will have lower limit and threshold limit which differs with each person according to their anxiety levels. These sensors help to stimulate the microprocessor and software which will record the AV (Audio – Video) of ongoing conversation, identify the person threshold limit to alarm him and also sending location. This can be used to forensics and in reduction of crime rate is possible, can be used in Medical field for B.P patient, stress management, and Health analysis. Moto of this technology is to say stress is main cause of miseries and that can be controlled by technology.**

***Index Terms* – stress management, adrenaline, anger, control, stress management, sensor, tracking, alerting, HTL, LTL. Zig-bee, Vedio Transmission**

I. INTRODUCTION

PROJECT SCOPE & OBJECTIVE

Stress is a physiological and psychological imbalance [9]. Stress comes in all forms and affects people of all ages and all walks of life. It arises due to the demands on a person and that person's inability to meet these demands. Stress is the body's way of reacting to any situation and it can have serious repercussions on an individual's life. Anger is an emotion. It is ok to be angry. Anger management programs for offenders typically aim to improve the management of emotion associated with aggressive and antisocial behavior [6].

The Moto of the Project is improving self controlling ability with the help of consciousness under sensor technology to manage stress and aggressive feelings. Objective of this technology is to lead a healthy life by reducing stress.

II. EXISTING SYSTEM

Stress management can help you to either remove or change the source of stress, alter the way you view a stressful event, lower the impact that stress might have on your body, and teach you alternative ways of coping. Stress management therapy will have the objective of pursuing one or more of these approaches. Stress management techniques can be gained if you read self-help books, or attend a stress management course. You can also seek the help of a counselor or psychotherapist for personal development or therapy sessions.

Stress patterns from GSR (Galvanic Skin Response) sensor [5] data used by doctors to analyze emotional level and council accordingly.

III. PROPOSED SYSTEM

AMT is new Technology to act as a self assistance with multi sensors [2] equipped in device. Hence each person who can maintain changes occurring in feelings of a person and Helps in Health Regulation.

- Basically it works in Sensors communication to activate system
- Sensors [1] used to analyze ADRINALINE (Hormone that causes anger and different feelings) impact on respective person.
- It works on anxiety limits they are LOWER TRESHOLD LIMIT and HIGHER TRESHOLD LIMIT which is predefined in system during installation on bases of personal adrenaline impact levels.
- The analysis recorded on bases of symptoms caused because of ADRINALINE (recognize through mainly 5 sensors namely Facial Image Processing, Pulse rate, Heartbeat, Spinal senses, Voice) [7].
- LTL activate device and starts AV(audio and Video) recording which can used as reference during discussion and as a proof for forensics

Similarly when it reaches HTL device alarms message to get down the discussion and also sends location to the needy for help. The basic functionality architecture is depicted in Fig.1 System Structural Architecture.

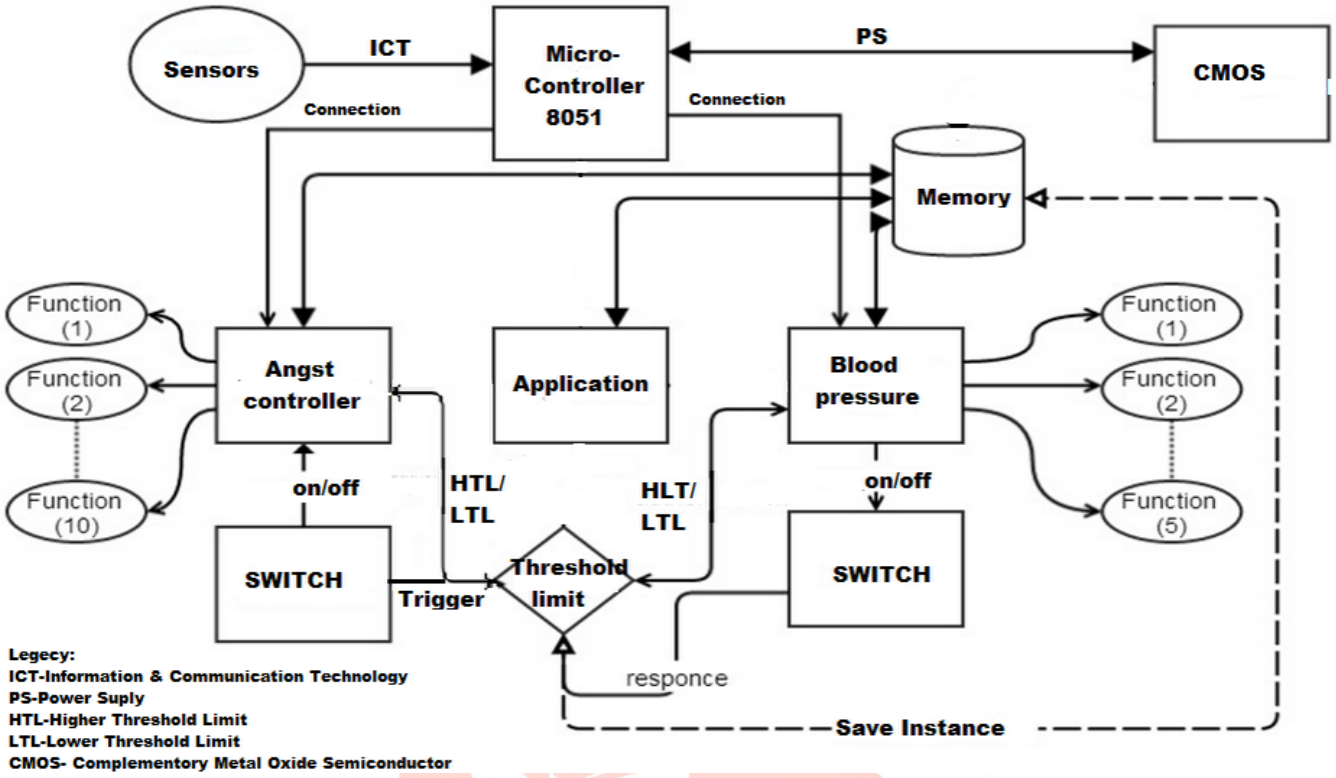


Fig.1 System Structural Architecture

IV. OVERALL DESCRIPTION

Product Perspective

AMT is a wearable device which can be made using existing technology. Using Transducers such as sensors & actuators connected with micro controller / micro processor provided power supply through capacitors and make circuit connection to run the device which should be coded using embedded c as per requirement. This device should on/off and function automatically which can be fixed through assigning micro controller/processor with LHT&HTL (Lower Threshold Limit & Higher Threshold Limit).

Product Functions

AMT has mainly 2 parts they are ANGST and B.P which are provided with 3 transducers for ANGST and 1 for B.P. These two parts provides 4 major functionalities such as AV Transmitting , Alerting with nerve simulator, Content Analysis, and Sharing Location with a message. In this Angst performs 3 and B.P perform sharing location using GPS technology.

- Pattern Data analysis as Content Analysis
- Audio Video transmission through zig-bee
- Alerting with minute shock
- Sharing Location

User Classes and Characteristics

In AMT sensors and actuators are main classes which are input and output transducers. Where I/P transducers work continuously according to LHT it switch's on its functionalities and according to HTL the O/P transducer triggers. Here main classes are sensors and sub sensors, microcontroller, power supply, receptors. This device depends on End-user environment accordingly sensors work but the results cannot same for every individual in every instinct and scenario

Operating Environment

AMT requires software's related to hardware platform during implementation. One is Micro controllers embedded system coding, Sensors pattern recognition software to set LHT & HTL using " Biomechatronic System " and other is maintaining application which can be referred as further extinction of this project this provides detail analysis and user interface to check users utility and GUI, helps to regulate by user according to results.

Design and Implementation Constraints

To design this device main problem is Size and weight. The size of sensors used should be designed as per our final product design considering all end-users constraints. Circuit connections are important aspect in design constraints. GPS technology implemented parallel which is different from rest of modules. Proper utilization of power source is very important to run the device. In case of supporting application then the memory of device should be connected with application's database, Device connect ability to application.

V. *External Interface Requirements*

User Interfaces

As AMT was under wearable's (like bikers Glouse) the device is not provided with any display interface but the system provided with a switch and led indicator if device is turn on/off. The extinction of this project can be provided with software application which can provide "Health Monitoring System" [6] providing user data in form of graphs. That application is provided with User Interface.

Hardware Interfaces

AMT contain mainly 4 units of hardware. They are Transducers, Microcontroller, Power Capacitors, GPS, Camera and Circuit Wires. Transducers are Pulse oximeter, Arm cluff, GSR, Temperature Probe. Microcontroller to be used of 8051 architecture provided with CMOS, GPS of Ublox and Camera with audio video recording capability.

Software Interfaces

AMT works on Sensor patterns recognition for an individual subject which can be retrieved through " Biomechatronic System ". Then the LTL & HTL is analyzed and connected to 8051 microcontroller using "Embedded C". Each part of functionality are to be connected to Micro controller through Embedded C [3]. Using Visual Basics we can connect wearable and analyze content same time video transmission through zig-bee [4][5] is also included.

Communications Interfaces

In this device functionality GPS works to share location to concern person when sensor identifies level reached to HTL(High Threshold Limit). GPS used was Ublox which share location using latitude n longitudinal lines through satellite communication system. These are basically used in vehicle tracing devices.

VI. SYSTEM FEATURES

The wearable device is made by collaborating all hardware equipment specified they are important to connect with proper coding. So it starts with coding respective part to connect with microcontroller, equipping each, testing on subjects.

Description and Priority

It basically includes 2 parts performing 3 functionalities such as Audio video recording, Alerting, Position Sharing and health monitoring can be added while designing suitable application. System will be automatically on when sensor pattern reaches LTL and activates AV recording, when system reaches HTL it activates Alerting and Position sharing occurs in part 1 i.e., Angst. Could be vise versa in case of part 2 i.e., Blood pressure

Stimulus/Response Sequences

AMT depends on Human body Stimulus the sensors equipped to human body [9]. When the Anger or B.P or some kind of emotional symptoms occur in a subject the system respond according to their functionalities

Functional Requirements

Sensors:-

- *Arm Cluff*
- *Pulse Oximeter*
- *Temperature Probe*

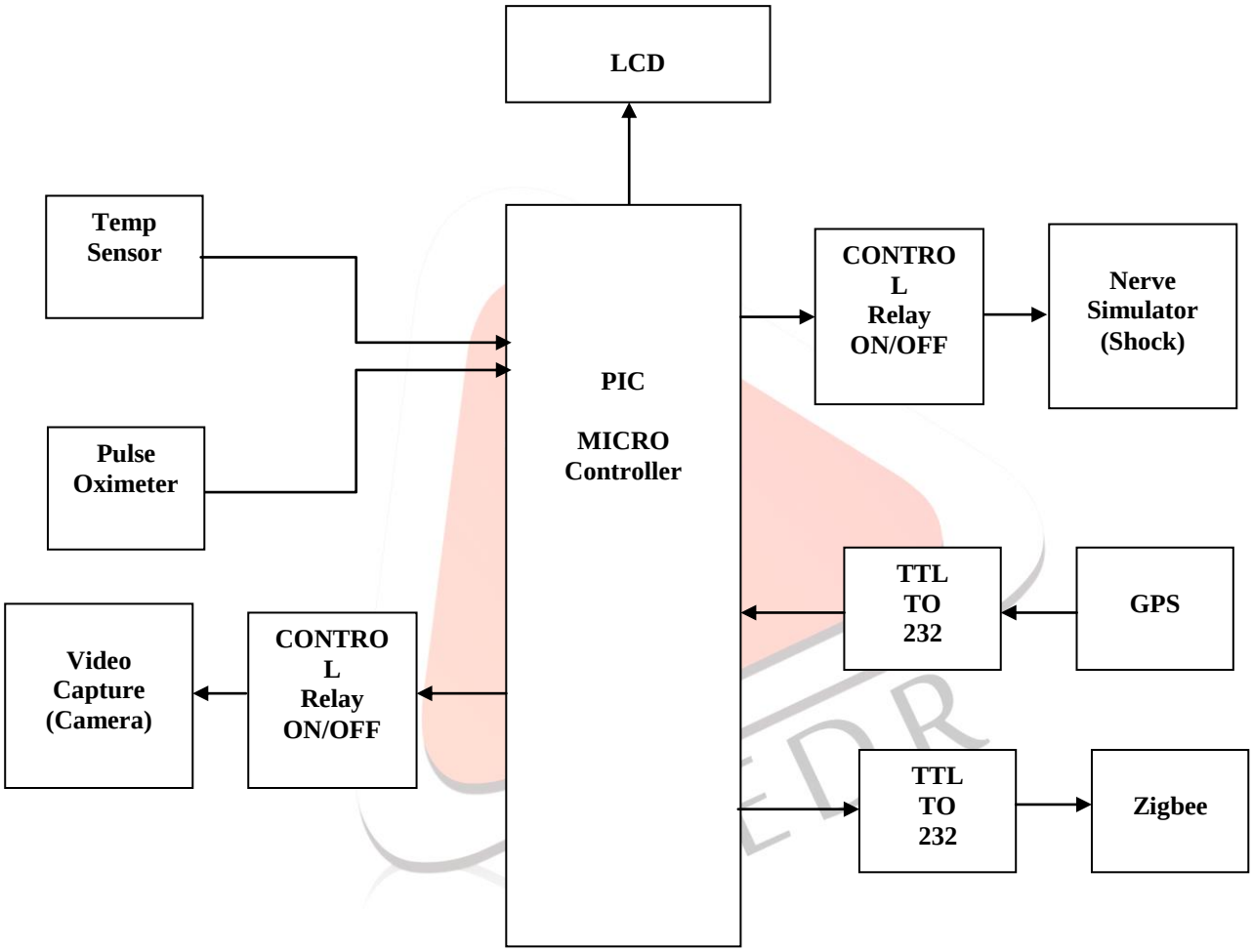
Microcontroller:-

- *8051MC*
- ***Power supply:-*** super capacitor of 12.7-17v
- ***GPS:-*** *Ublox*
- ***Camera***
- ***Zigbee***

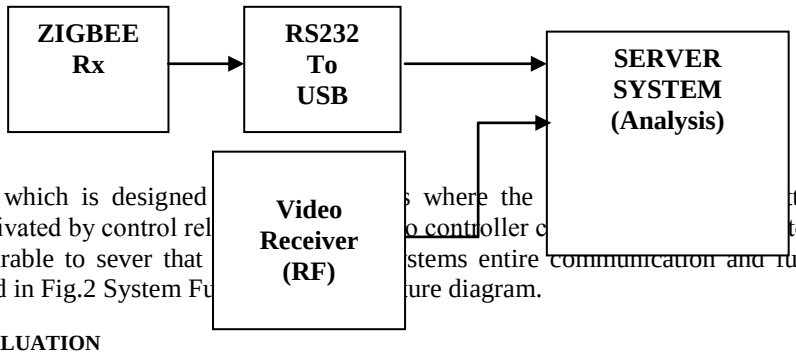
VII. System Circuit

Fig.2 System Functional Architecture

Wearable side:



Server Side:



Server side is the application part which is designed s where the tted directly to the application when the system gets activated by control rel o controller c to store whole data. Zig-bee helps to transmit from wearable to sever that stems entire communication and functioning between wearable and application is explained in Fig.2 System Fu ure diagram.

VIII. PATTERN RECOGNITION & EVALUATION

To make system to activate automatically we need to set average starting point and peak point i.e., generating LTH (Lower Threshold Limit) & HTL (Higher Threshold Limit). So we use Subjects to analyze the sensor response using software [8] Biomechatronic System and mathematical evaluation [10].

Mathematical expression helps to fix the LTH & HTL with the help of "Mean & Median Frequency". This can be implemented as Logic in "Embedded C" code implementation. So microcontroller detects sensors responses and activates system functionalities as code implemented. Refer diagram fig.3 Automation by pattern recognition.

Feature extraction module:
The data retrieved from sensors is analyzed [8]. The pre-processed biosignals are converted into vectors of extracted features that can be used by Intelligence Emotion Recognition module in order to determine subject's basic emotion. Controlled using control relay connected to Micro Controller.

Mean & Median Frequency:
They Compute vectors of median frequency over time for a specific input signal. Mean of the absolute values of 1st and 2nd differences (mean_abs_fd and mean_abs_sd) for an acquired biosignal XN=(x1,x2,…xN) the mean_abs_fd and mean_abs_sd are defined [10] as:

$$mean\_abs\_fd = 1N - 1\varepsilon n = 1N - 1|xn + 1 - xn|$$
$$mean\_abs\_fd = 1N - 1\varepsilon n = 1N - 1|xn + 1 - xn|$$

where denotes a signal sample and N is number of samples .These features are approximations of the 1st and 2nd derivate respectively and therefore fast changes in recorded biosignals.

The Intelligence emotion recognition module
It is a A.I knowledge base where decision support system classifies subjects state. The emotional classes was achieved using Support Vector Machines (SVM). SVM belongs to kernel based classifiers. It maps the data with decision boundaries i.e., HTL & LTL by performing calculation in data space. Refer diagram fig.3 Automation by pattern recognition.

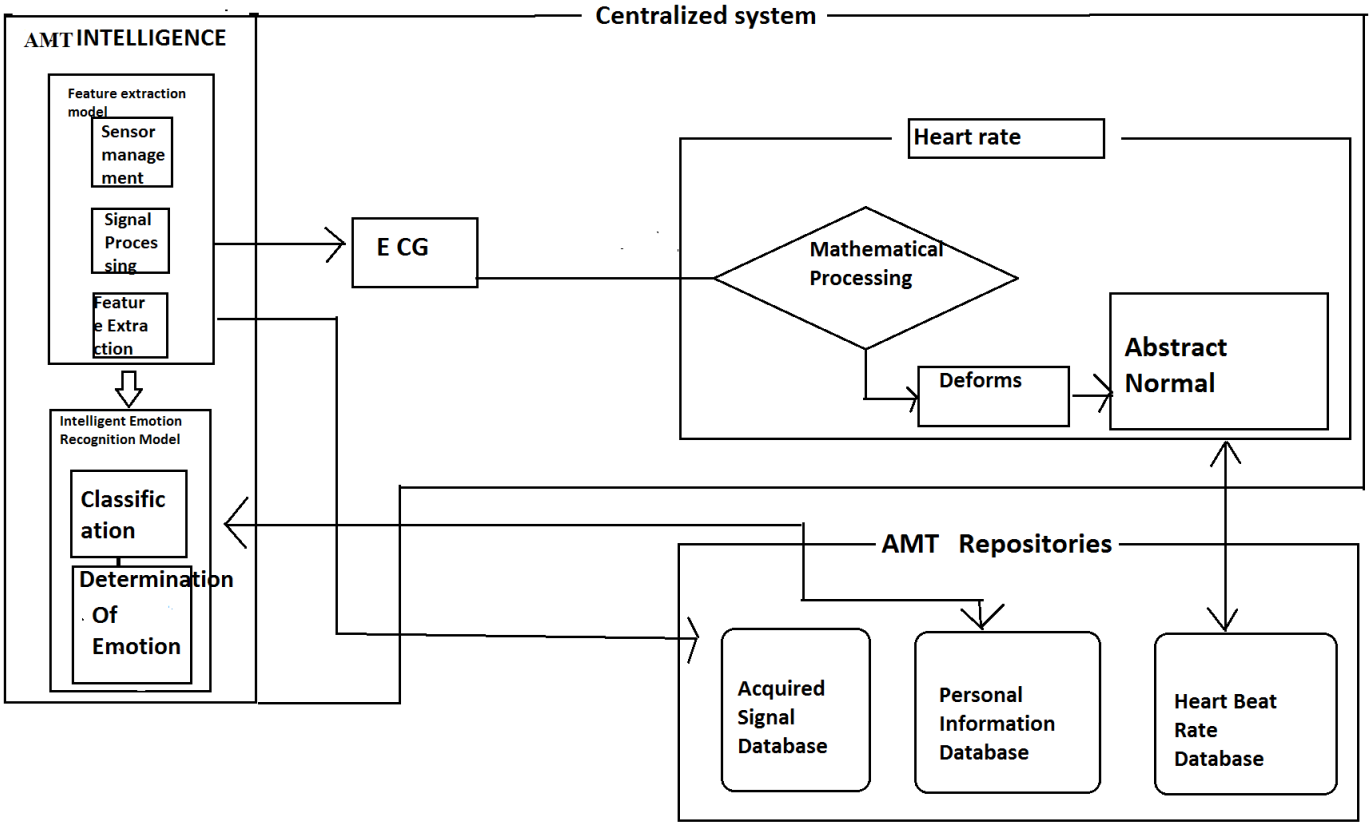


Fig.3 Automation by pattern recognition

IX. ADVANTAGES & DISADVANTAGES

Advantages:
- Self assistance
- Automatic action
- Safety and security ensured
- Health consciousness

Disadvantages:
- Not perfectly accurate
- Responds on any sensory emotions
- Gadget based need to equip all the time

X. CONCLUSION

This is a product based research project which can used for persons facing stress problems, used in forensics , doctors and can also used for IT job holders. Management of anger or stress is achieved using technology and self controlling analysis rather than Rehabs and counseling's.

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