Section 4

Analytics and alerts on women safety using mobile microphone and public area cameras.

In todays time where the woman is not safe even in a country which is personified as a goddess and not a god, here the woman is not safe in the streets even during the peak hours in the present scenario.
We aim to solve this exponentially growing issue by developing an android based application which will be using the inbuilt microphone of our mobile phones and public area cameras.

Android App

In the backend, developers will add data samples which will act as a training set for the application (data acquisition), which will enable the application to distinguish the distressful voice in case of emergencies by analyzing various sound parameters like pitch, amplitude, etc.. Later during installing phase the user will be asked to enter a fixed number of samples of her voice as a part of data acquisition along with a "distress codeword" which will help us to customize the application voice recognition according to the user. Also a 10 second message will be recorded by the user which will be used during any distress call.

During an inhuman situation like (molestation, kidnapping etc) there will be two ways of identifying and activating the application.

1) Use of Codeword
2) Unusual change in Voice Parameters

In either of the cases

- Text message will be sent to X number of people listed as top contacts by the user during the process of installation.
  The message can be either "I AM IN DANGER" or customized according to the user.
  Along with it the location of the user will also be sent as a link which can be viewed with the help of GOOGLE MAPS
- An attempt to call the contacts listed as top contacts (until one picks up the phone) and a pre recorded message will be sent at first and the call will remain connected so that the contact can hear whatever is happening.
- With the help of google maps (Live Location)
    - A call will be made to police stations in close proximity of the location where the incident is taking place (begin with a pre-recorded message and then call remains connected).
    - All the public cameras that are in close proximity of the location where incident happened will be sent a signal to transmit the data immediately to cloud storage which could be later viewed by the police officers at police station for investigation purposes.

- As soon as an impact is detected on the phone (in an attempt to destroy the phone by the hostile party) the data recorded along with the live location link will be sent to the google drive, which could be used as a proof.

Training	Processing	Platform	Network
Data Acquisition	Offline	Smartphone	PeertoPeer (primarily)

Public Area Cameras

- A public area camera (e.g. CCTV camera at red lights, crowded markets etc) will be installed with a system on chip (Raspberry Pi module) which will be responsible for Image Processing and Communication purpose.

- The use of Public Area Cameras will also help in tackling cases in which the victims does not have the application installed on his /her device or the phone is switched off because of low battery.

- Image processing will be a key tool which can be used to identify
    - Assault
    - Kidnapping
    - Woman Molestation
  - These can be judged on parameters like
    - Assault weapon
    - Crowd gathering
    - Gesture and movements

- Communication is another critical aspect which is required for
    - Contact adjacent public area cameras to track the incident with the best view possible and also find the track of kidnapping vehicle with the help of Vehicle Number.
    - Contact and inform nearby devices with application installed about the particular incident by giving notifications.

The above is all implemented with the help of processing on the attached system on chip (Raspberry Pi module) which will help to reduce the latency which might increase during cloud computing method.

The information about the assault can also be shared with the nearby mobile phones with our application installed. This could be achieved by sending the assault alert from RPi to the cloud and at the application end, we can implement a

simple Rest API which can retrieve this data and post crosschecking whether the device is nearby or not (in a radius of X kms), the notification about the incident will be sent to their applications for demanding HELP. We propose to use multithreading for implementing this whole module in the RPi module. Three threads could be used for Image Processing and one for communication purposes.

Training	Processing	Platform	Network
Datasets	Offline	RaspberryPi	Cloud Architecture

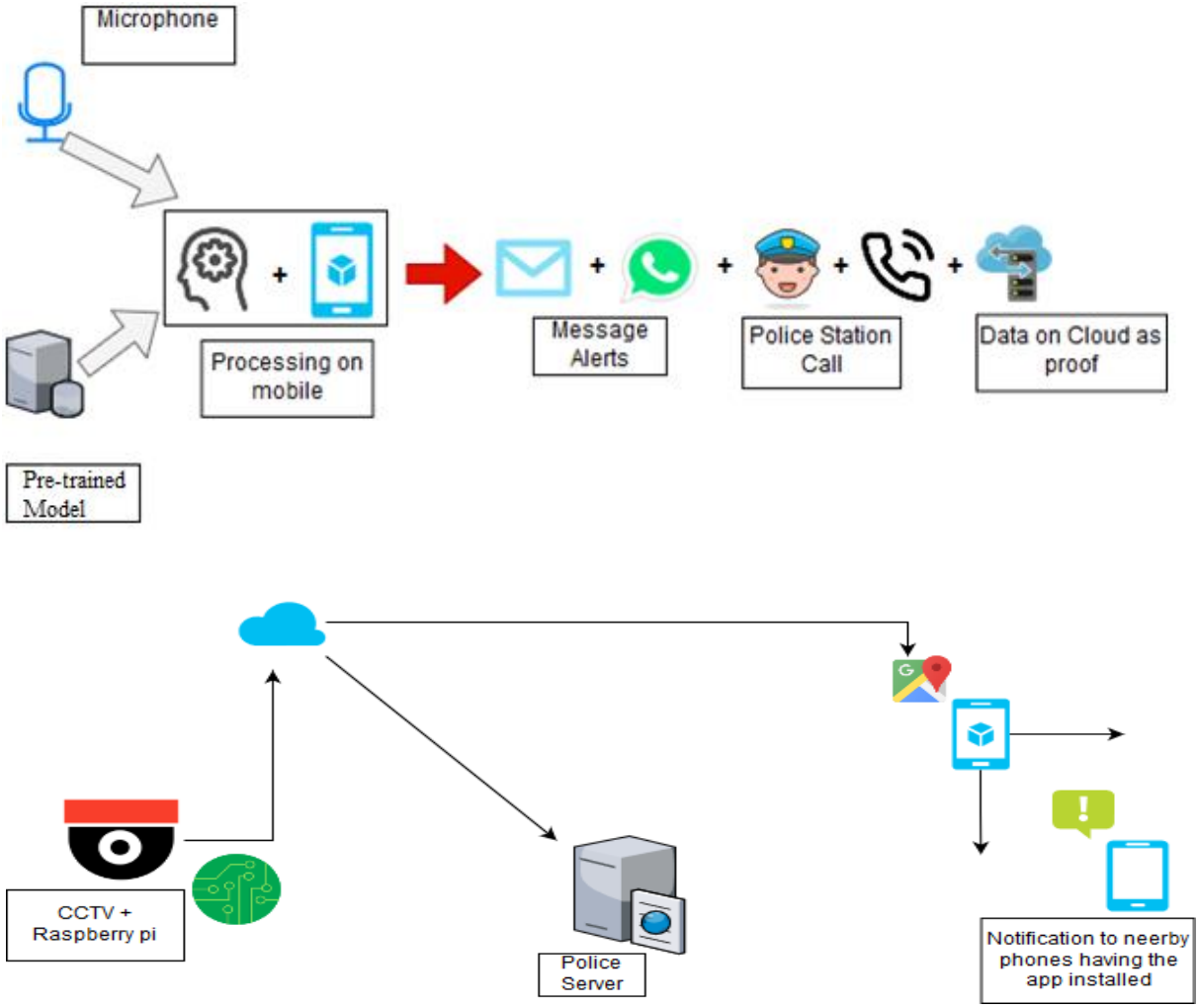

Fig.2 Block Diagram