PRE-DOCUMENTATION

* About the Organisation:

Directorate of Information Technology and Cyber Security (DIT&CS) looks after Information Technology and Cyber security related activities in DRDO. DIT&CS operates and maintains DRDO Organizational Network and Centralized Internet Access Gateway for all labs and establishments of DRDO. The directorate develops and updates new software application for current prevailing solutions in various fields.

* Our Understanding of the Problem Statement:

This problem statement has been provided by this organisation in order to produce an effective solution for CAPTCHA or an alternative which is required to address the problems faced by the visually impaired person for authenticating themselves.

* Model:

1. **Prevailing System**-Currently ,a system of audio captcha is being used for authentication by the visually impaired person but many citizens find it difficult to decipher with the increase of noise barrier in the background .
2. **Our Proposal-**We are using the vibration functionality sensing of a human being in order to provide an alternative to the already being used audio captcha. We try to make the visually impaired person sense the vibration in a morse code pattern which must be memorized by the blind person. The person senses the pattern and recognizes the text in the captcha accordingly.

**The steps include:**

* + - * + **Login Portal-**where the person is asked to authenticate himself by providing the captcha text after he fills out his form or any related document.
        + **POP UP-**A popup occurs asking the user to connect the website with the mobile application with two options, “Yes” or “No”.
        + **Tesseract OCR-**If the person clicks “Yes” ,the extension does two work at a time, firstly it passes the image to the back end of the website for text extraction and secondly, it moves the cursor to the dialogue box where the captcha is to be entered. At the backend, the text is extracted from the captcha image and passed to the mobile application
        + **Javascript Code-**which runs on the mobie app and converts this text into its equivalent morse code.
        + **playMorseCode() Function-**It plays the morse code pattern by passing a certain amount of value in the array for determining the duration of the vibration and the hault b/w two words or letters.
        + **Sensing-**This vibration pattern is sensed by the visually impaired person and the actor enters the captcha accordingly.
* Feature List:

1. **Actor-**In this project ,the main actor is the visually impaired person as we are trying to produce a schema whose most of the part can be handled by the blind person without the need of any help. The blind person allows the website to connect to the mobile application,senses the morse code pattern on the same and finally enters it.
2. **Administrator-**The admin here can modify the pattern of the morse code according to his need and can also apply changes to the extension which is being used on the webpage i.e. how should we extract the image at the back end and connect to the mobile application in case the admin feels there is a need of modification.

* Use Cases:

1. **OCR-**The most important use case of this project is the Image extraction through OCR technique as we can not play the morse code with an image as input. We need the captcha image in the text format.
2. **Mobile App-**We need a mobile application which can convert the text into morse code and play the pattern on any platform capable of producing vibration in order to be sensed by the visually impaired person.

* Technology Stack:

1. **Front End(Website):** We create a Javascript API extension which can be installed on the browser being used by the visually impaired person. Apart from this we use WordPress, as a tool for creating a sample website on which this extension can be applied.
2. **Backend(Website):**We use Tesseract as an OCR engine at the back end of the website for extracting the text from the captcha image and we may also use DynamSoft’s SDK for the same.
3. **Application:**XML or Javascript code to convert the text into morse code and play the corresponding pattern on the mobile application to be sensed by the actor.