PROJECT REPORT

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INDROCTION

Hand gestures are a form of nonverbal communication that can be used in several fields such as communication between deaf-mute people, robot control, human–computer interaction (HCI), home automation and medical applications. Research papers based on hand gestures have adopted many different techniques, including those based on instrumented sensor technology and computer vision. In other words, the hand sign can be classified under many headings, such as posture and gesture, as well as dynamic and static, or a hybrid of the two. This paper focuses on a review of the literature on hand gesture techniques and introduces their merits and limitations under different circumstances. In addition, it tabulates the performance of these methods, focusing on computer vision techniques that deal with the similarity and difference points, technique of hand segmentation used, classification algorithms and drawbacks, number and types of gestures, dataset used, detection range (distance) and type of camera used. This paper is a thorough general overview of hand gesture methods with a brief discussion of some possible applications.

purpose

Hand Gesture Methods The primary goal in studying gesture recognition is to introduce a system that can detect specific human gestures and use them to **convey information or for command and control purposes**. Therefore, it includes not only tracking of human movement, but also the interpretation of that movement as significant commands.

LITERATURE SURVEY

The vast majority of hand gesture recognition work has used mechanical sensing, most often for direct manipulation of a virtual environment and occasionally for symbolic communication. Sensing the hand posture mechanically has a range of problems, however, including reliability, accuracy and electromagnetic noise. Visual sensing has the potential to make gesture interaction more practical, but potentially embodies some of the most difficult problems in machine vision. The hand is a non-rigid object and even worse self-occlusion is very usual.

Full ASL recognition systems (words, phrases) incorporate data gloves. From their paper, it seems the test user made each of the 46 gestures 10 times to provide data for principle component and cluster analysis. The user created a separate test from five iterations of the alphabet, with each gesture well separated in time. While these systems are technically interesting, they suffer from a lack of training.

Excellent work has been done in support of machine sign language recognition by *Sperling and Parish*, who have done careful studies on the bandwidth necessary for a sign conversation using spatially and temporally sub-sampled images. Point light experiments (where “lights” are attached to significant locations on the body and just these points are used for recognition), have been carried out by *Poizner.* Most systems to date study isolate/static gestures. In most of the cases those are finger spelling signs.

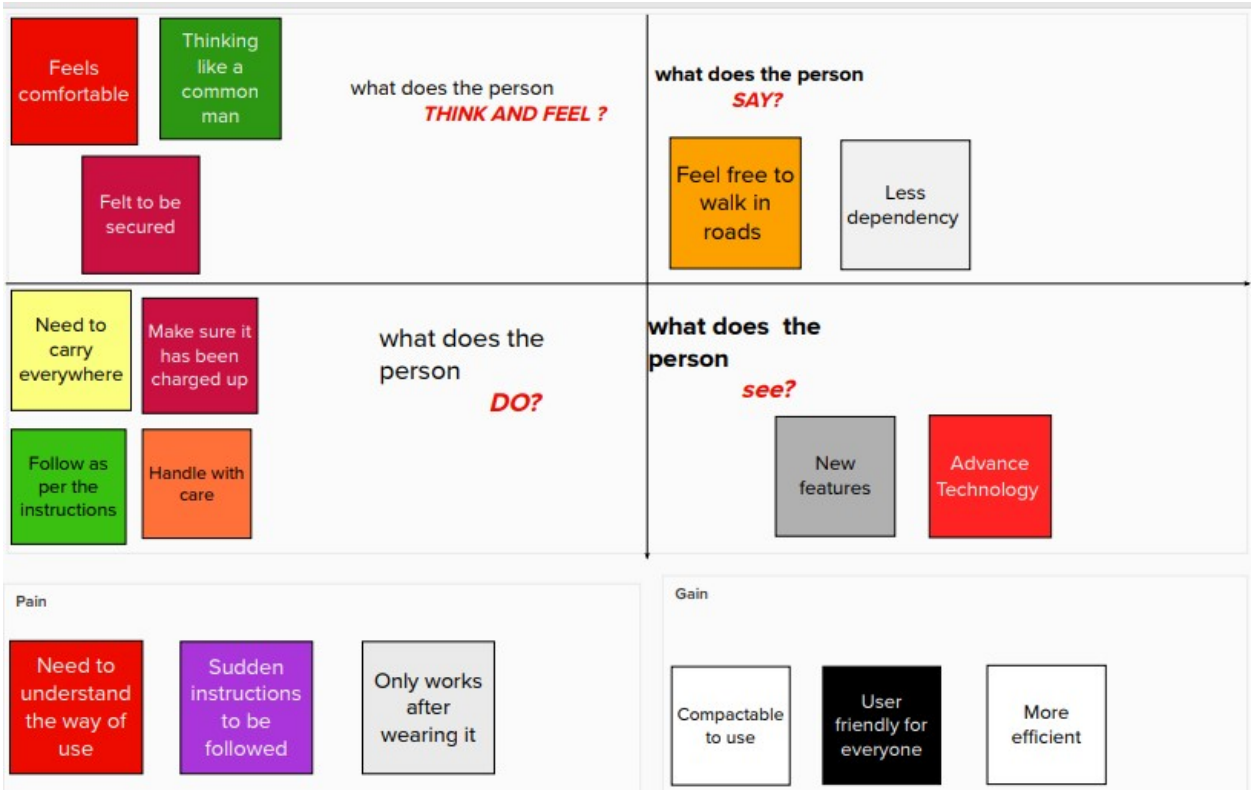
References

1.Smart Shoes for Visually Impaired/Blind People
Authors: Moaiad Khder
2. Design and Implementation of Voice Assisted Smart Glasses for Visually Impaired People Using Google Vision API
Authors: P. Selvi Rejandran
3.Sonification: Review of Auditory Display Solutions in Electronic Travel Aids for the Blind
Authors: M. Bujacz

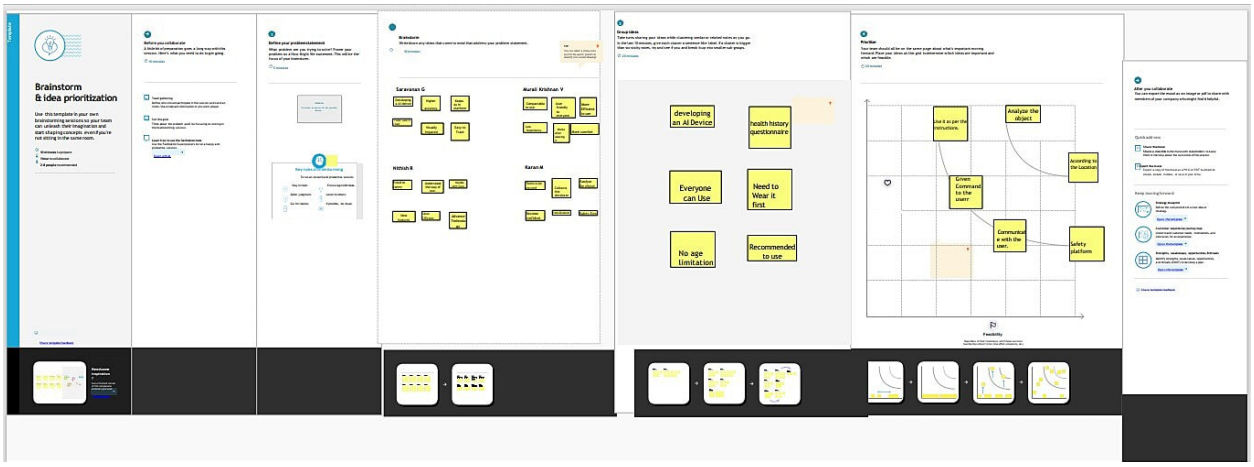
Problem Statement Definition

The main problem faced by specially abled persons negative attitudes held by family of the disabled and often the disabled themselves hinder disabled persons from taking active part in the family ,community or workforce differently-abled people face discrimination in everyday life.lack of accessibility both in terms of physically in access prejudice which prevents people with disabilities from accessing education on equals terms to others.

IDEATION & PROPOSED SOLUTION



Ideation & Brainstorming

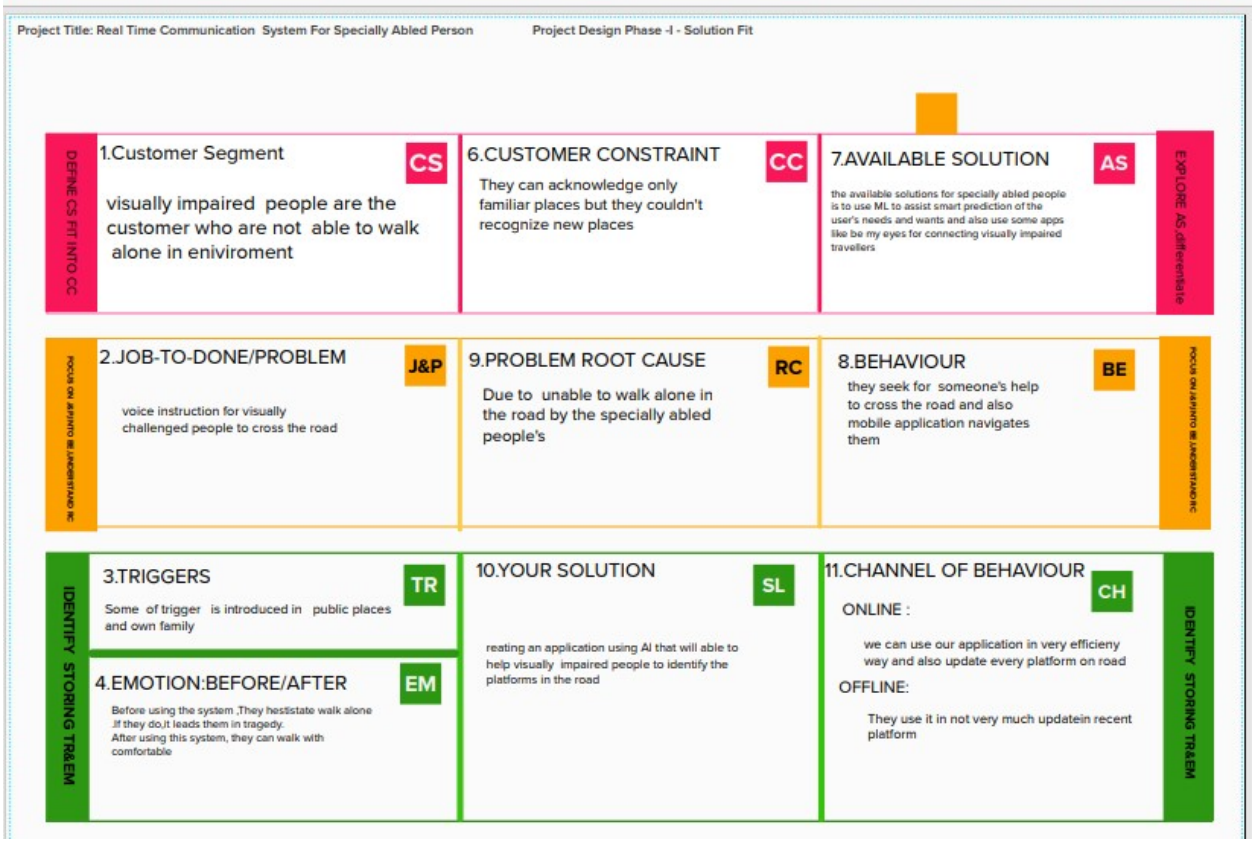


Proposed Solution

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
•	Problem Statement (Problem to be solved)	A SmartGlass that powered by Artifical Intelligence to sense the platforms and to keep as in platforms.
•	Idea / Solution description	Creating an application that gives us command to stay in the platforms.
•	Novelty / Uniqueness	Lane keeping Assistant and Image Processing based AI that supports to detects the objects.
•	Social Impact / Customer Satisfaction	It reduces the dependency and feels to be confident while using platforms and roads.
•	Business Model (Revenue Model)	Offering monthly or yearly subscription for premium features.
•	Scalability of the Solution	Implementing Lane Keeping Assistance in the smartglass to keeps as in platforms.

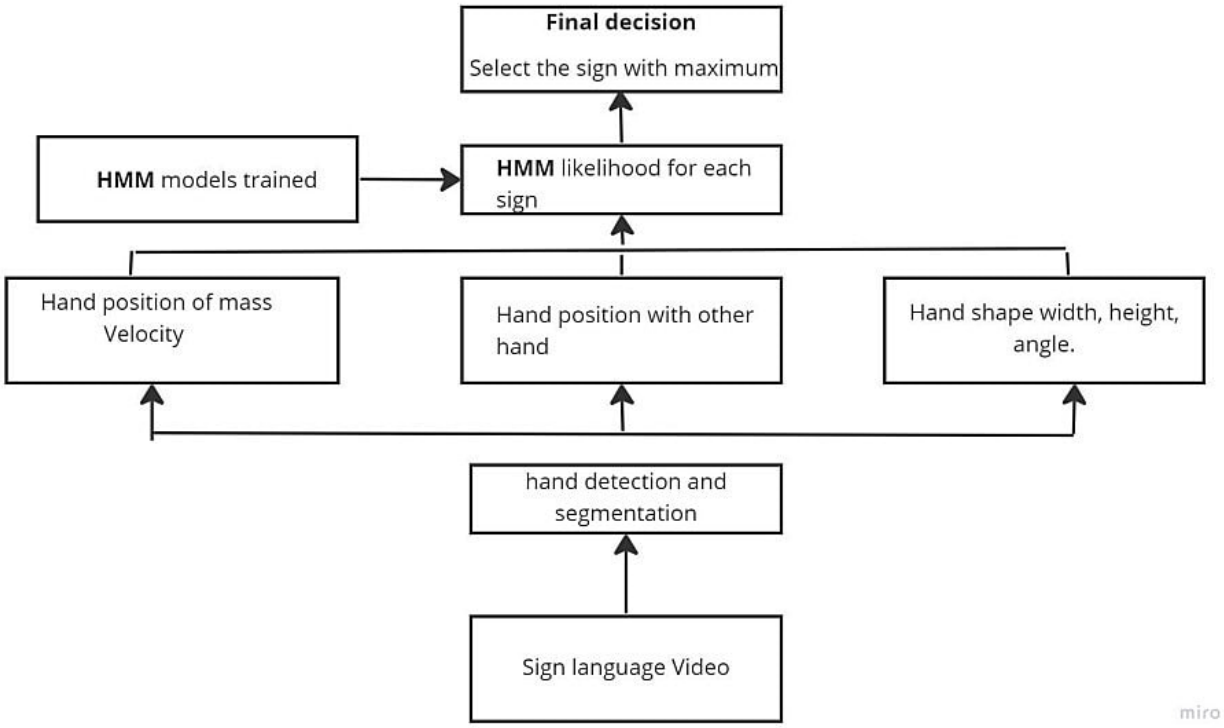
Problem Solution fit



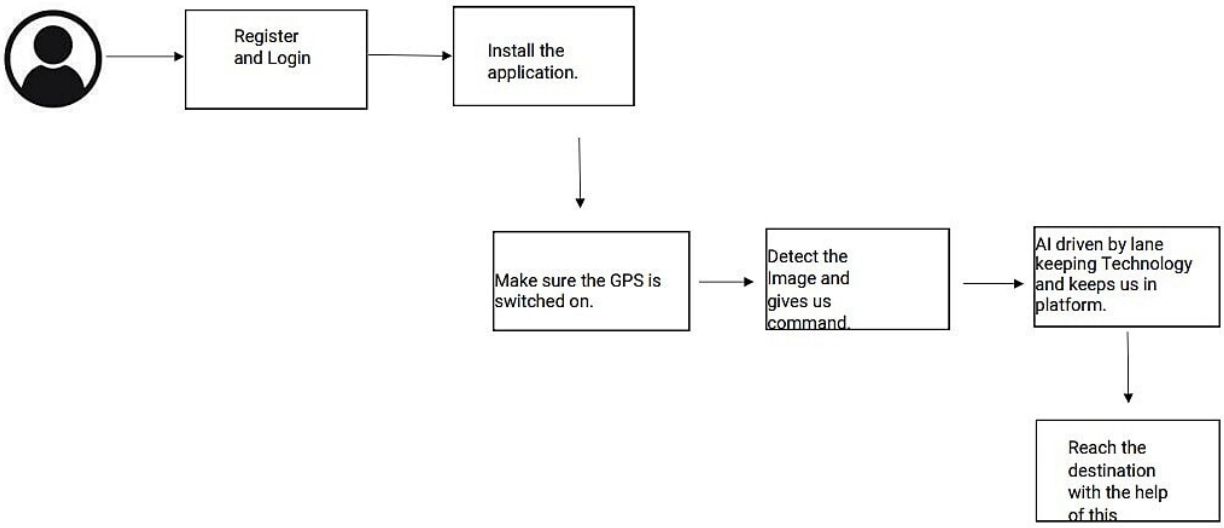
PROJECT DESIGN

Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



Solution & Technical Architecture



Project Planning And Scheduling

Sprint Planning & Estimation

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	Collect Dataset .	9	High	ANSHEL DANY MERSTIN.P, HARISH.R
Sprint-1		USN-2	Image preprocessing	8	Medium	ANSHEL DANY MERSTIN.P, HARISH.R
Sprint-2	Model Building	USN-3	Import the required libraries, add the necessary layers and compile the model	10	High	ARUNA.A, AKASH.S
Sprint-2		USN-4	Training the image classification model using CNN	7	Medium	ARUNA.A, AKASH.S
Sprint-3	Training and Testing	USN-5	Training the model and testing the model's performance	9	High	ANSHEL DANY MERSTIN.P, ARUNA.A
Sprint-4	Implementation of the application	USN-6	Converting the input sign language images into English alphabets	8	Medium	HARISH.R, AKASH.S

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	10	6 Days	31 Oct 2022	05 Nov 2022	8	05 Nov 2022
Sprint-2	10	6 Days	07 Nov 2022	12 Nov 2022	5	12 Nov 2022
Sprint-3	10	6 Days	14 Nov 2022	19 Nov 2022	7	19 Nov 2022
Sprint-4	10	6 Days	21 Nov 2022	26 Nov 2022	5	26 Nov 2022

CODING & SOLUTIONING

Feature 1

- Fetched the data from DB2 database.
- Creating responsive dashboard.
- Inserting filter for each chart
- Creating report
- Created reports using multiple graphs and charts

Feature 2

- Creating stories and performed.
- Perform animation render image from website.
- Included graphs and charts.
- Creating web application using bootstrap.
- Embedded the cosign with web application.

Dataset

- Conversation engine for deaf and dumb
- Problem Formulation
- Gesture Recognition Section
- Method And Block Diagram
- Result And Discussion
- Conclusion

Testing

-

Initialize The Model

- Import the required model building libraries
- Compile the model

- Apply image data-generator functionality
- Testing the Models

- Testing the predicting images

RESULTS

```
#Load the model
model=load_model('des.h5')

img=image.load_img('/content/Dataset/training_set/D/1002.png',target_size=(400,500))
img
```

ADVANTAGES

- Sign Language Recognition
- Robot Control
- Graphic Editor Control
- Virtual Environments
- Numbers Recognition
- 3D Modelling

Drawbacks

In this section, drawbacks of some discussed methods are explained: Orientation histogram method applied and have some problems which are; similar gestures might have different orientation histograms and different gestures could have similar orientation histograms, besides that, the proposed method achieved well for any objects that dominate the image even

if it is not the hand gesture. Neural Network classifier has been applied for gestures classification but it is time consuming and when the number of training data increase, the time needed for classification are increased. While the system proposed in for controlling a robot, can counts number of active fingers only without regard to which particular fingers are active with a fixed set of commends .

FUTURE SCOPE

Sign language is a method used for communication by disabled person. Here we are converting sign language into text and speech so that communication is not limited between them only, utilizing data gloves communication barrier between two different communities is eliminated. Using data gloves disabled person can also grow in their carrier and makes nation grow as percentage of disabled person are millions in count. Making their future better ,making nation better.

APPENDIX

source code:

GitHub link:

https://github.com/IBM-EPBL/IBM-Project-2230-1658467173