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This Abled: An Aid to get Paid

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Abstract— *Our website "This-Abled" aims to provide aid to specially-abled students by creating a web-based job search portal especially designed for the physically challenged. In order to ease the experience for the disabled, we will provide gesture control to navigate across the website. This responsive and dynamic website will help the needy and physically disabled get a job and get a chance to live an independent life. While on the other hand, the employer will get a needy and hardworking employee. The website will also have a separate section for education where special students can learn certain courses according to the requirements of the employer or company.*
Index Terms— *Feature extraction, Gesture recognition, Classification algorithms, Computers, Training, Communication systems, Assistive technology*

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I. INTRODUCTION

Job seekers today have access to a wide range of job vacancies through job search engines or job portals, enabling them to search for opportunities at their own pace. These portals often include filters that help users narrow down their search results, making it easier for job seekers to identify suitable career options. Additionally, online job search sites benefit employers by streamlining their hiring process, as they can easily verify job applications online rather than manually reviewing printed resumes. This saves recruiters and hiring managers time and effort.

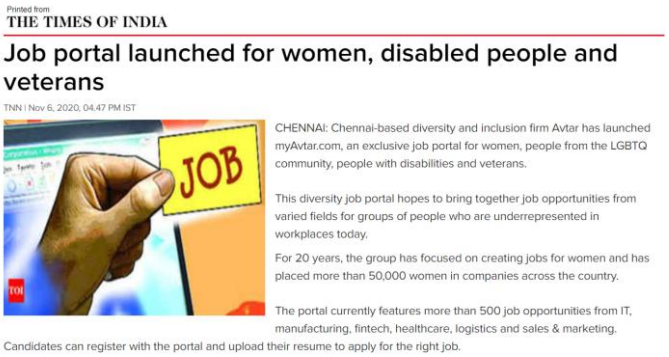
However, individuals with disabilities face significant challenges in finding employment compared to non-disabled individuals worldwide. It is estimated that there are 785 million people of working age with disabilities who are more likely to be unemployed, have fewer job opportunities, and be economically inactive, making them invisible in labor market statistics. People with disabilities often experience underemployment, working in low-paying jobs with limited advancement opportunities and poor working conditions, particularly women with disabilities. The International Labour Organization (ILO) predicts that this situation results in significant social and economic losses, ranging from 3 to 7 percent of global GDP.

These observations have inspired us to develop a website that specifically caters to individuals with disabilities, providing them with opportunities to earn a livelihood and become self-reliant. In this work, our focus is to analyze online recruitment for people with disabilities via the web, with a particular emphasis on issues related to accessibility and usability tools on the web.

II. LITERATURE SURVEY

A number of articles, research papers, and interactions with a number of experts were performed as a part of a literature survey. The details for the same include:

Article 1:



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THE TIMES OF INDIA

Job portal launched for women, disabled people and veterans

TNN | Nov 6, 2020, 04.47 PM IST

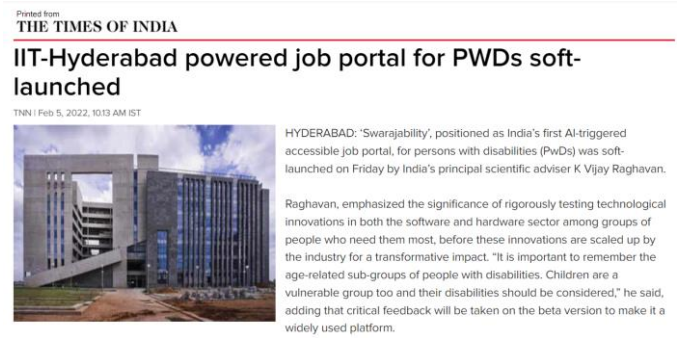
CHENNAI: Chennai-based diversity and inclusion firm Avtar has launched myAvtar.com, an exclusive job portal for women, people from the LGBTQ community, people with disabilities and veterans.

This diversity job portal hopes to bring together job opportunities from varied fields for groups of people who are underrepresented in workplaces today.

For 20 years, the group has focused on creating jobs for women and has placed more than 50,000 women in companies across the country.

The portal currently features more than 500 job opportunities from IT, manufacturing, fintech, healthcare, logistics and sales & marketing. Candidates can register with the portal and upload their resume to apply for the right job.

Article 2:



Printed from
THE TIMES OF INDIA

IIT-Hyderabad powered job portal for PWDs soft-launched

TNN | Feb 5, 2022, 10.13 AM IST

HYDERABAD: 'Swarajability', positioned as India's first AI-triggered accessible job portal, for persons with disabilities (PwDs) was soft-launched on Friday by India's principal scientific adviser K Vijay Raghavan.

Raghavan, emphasized the significance of rigorously testing technological innovations in both the software and hardware sector among groups of people who need them most, before these innovations are scaled up by the industry for a transformative impact. "It is important to remember the age-related sub-groups of people with disabilities. Children are a vulnerable group too and their disabilities should be considered," he said, adding that critical feedback will be taken on the beta version to make it a widely used platform.

Research Papers:

The study by Anusha Bhargava et al [1] proposed a method using Raspberry Pi for webcam device acquisition, image preparation for regions of interest, template recognition for characters and objects detection, OCR scanning, text production, image conversion, and text conversion at pace. Madeo RCB, Lima CAM, Peres SM [2] conducted a study on automated hand gesture analysis, focusing on seven patient monitoring applications using vision-based techniques, such as fall detection, action monitoring, activity monitoring, epilepsy monitoring, vital signs monitoring, and facial expression monitoring. V. Manimegalai, A. Gayathri, Naveen M, Neha J, Nikhil B, and Nithyanand C [3] emphasized on empowering differently abled persons through an IoT-based system, consisting of three major modules dedicated to the visually, audibly, and vocally challenged. Mykola Fisun, Alyona Shved, Yuriy Nezdoliy, and Yevhen Davydenko [4] discussed the experience in applying information technologies for teaching disabled students, considering the methodology of combining full-time and distance education and suggesting a set of software and technical means for training courses. Vaibhav Patil [5] proposed the use of virtual assistants for the physically challenged, which has the potential to save resources, time, and assist those who have difficulty with manual operations. Al-shamayleh AS, Ahmad R, Abushariah MAM [6] presented a systematic literature review on vision-based gesture recognition techniques, including types of gesture description and phases of gestures. Benalcázar ME et al [7] conducted a study on real-time hand gesture recognition using the Myo armband and muscle activity detection, including static and dynamic hand gesture recognition, and the use of supervised and unsupervised learning with RGB-D cameras. Suarez J, Murphy RR [8] conducted a literature review on hand gesture recognition with depth images, examining different hand localization and gesture classification methods, applications, and the effects of low-cost Kinect and OpenNI software libraries. The study by [9] proposed the use of convolutional neural networks for hand gesture recognition, utilizing the characteristics of convolutional neural networks to avoid feature extraction and improve model validity and robustness. Another paper [10] proposed a gesture recognition method using convolutional neural networks with preprocessing techniques such as morphological filters, contour generation, polygonal approximation, and segmentation for better feature extraction, and compared with other architectures and methodologies. L. Monti and G. Delnevo [11] suggested an improved version of the GlovePi system, a low-cost wearable device for deaf-blind communication, which aims to increase the inclusion of deaf-blind people in social life and daily activities by supporting many-to-many communication.

The authors, Calle-Urgiléz, A. GuzhñayLucero, V. Robles-Bikbaev, and M. Mena-Salcedo, present a low-cost system in their paper that can meet the needs of blind individuals, including face recognition, medication reminders, automatic mail reading, and detection of objects and distances. The proposed system can be easily

integrated into any type of glove. To assess the feasibility of the approach, the authors conducted experiments involving 5 individuals with visual impairments [12].

In their study, J. Sanchez and T. Hassler introduce an adapted version of the Mastermind game for blind users, called MasterBlind. The game mechanics were simplified, and auditory feedback was incorporated to aid blind individuals in playing the game. The objective of the research was to determine which types of sounds would be most effective in assisting blind players [13].

In their work, M. Lumbreras and J. Sánchez acknowledge the challenges faced by differently abled individuals, including visual, auditory, and vocal impairments, and highlight that addressing these problems with a single device is complex. While existing research has proposed solutions separately for each problem, the aim of their project is to create a simple, fast, accurate, and cost-effective single-device solution. The main purpose of the device is to empower differently abled individuals by providing them with the ability to see, hear, and communicate [14].

The authors, N. K., S. P., and S. K., aim to create a single-device solution that is simple, fast, accurate, and cost-effective to empower differently abled individuals to be independent and confident by providing them with the ability to see, hear, and communicate. Their paper presents a Google API and Raspberry Pi-based aid for blind,deaf, and mute individuals. The proposed device allows visually challenged people to read by capturing an image and converting it into text through image-to-text conversion and speech synthesis. The extracted text is then converted into audio format for reading out, and the device also has the capability to translate documents, books, and other materials for daily use.

Apart from these various articles from the web indicate that the employment status of groups with different disabilities was potentially important moderating factors (workability, structural and individual factors). A secondary analysis was performed on 4359 respondents with disabilities from Statistics Sweden's Labor Market Investigation. The respondents were divided into six disability groups (communicative-hearing, communicative-speech-reading, communicative-vision, psychological disability, medical disability, and physical disability). Logistic regression analyses showed that the probability of being employed was highest among respondents with hearing disabilities and respondents with psychological disabilities were least likely to be employed. Being a woman (very young or old) with only primary education and with partially or very impaired work ability, reduced employment opportunities.

III. PROBLEM STATEMENT

This-Abled focuses on the challenges faced by the specially-abled students and helps make them self-dependent by providing them with a portal that will be user-friendly. The users will be able to browse the website on their own without anyone's assistance. Job Portal For Physically Disabled People "This-Abled" is a web-based job search portal especially designed for the physically challenged. The login will be based on facial recognition.

Our goal is to empower the disabled by providing them with a user-friendly website that they can browse independently. The login process will utilize facial recognition technology to make it easy and convenient for users to access the site.

To further enhance the user experience, we will also implement gesture control features that allow users to navigate the website using head or finger movements and click by blinking their eyes. Additionally, we will provide a virtual keyboard for registration and other necessary inputs.

Our dynamic and responsive website aims to bridge the gap between employers and physically disabled job seekers. By providing a platform that meets the specific needs of the disabled community, we hope to promote inclusivity and diversity in the workforce while also helping employers find hardworking and qualified employees.

We understand the unique challenges faced by the disabled community when it comes to finding employment opportunities. Our team is dedicated to creating a solution that addresses these challenges and empowers individuals with disabilities to achieve their professional goals and lead independent lives.

IV. PROPOSED SOLUTION

Our website, 'This-Abled,' is dedicated to providing assistance to individuals with disabilities by creating a web-based job search portal specifically designed for individuals who are physically challenged. To enhance the user experience for individuals with disabilities, we will incorporate gesture control for website navigation. Our website will be responsive and dynamic, aiming to help individuals with disabilities find employment opportunities and live independent lives. Employers will also benefit from our platform by connecting with motivated and capable employees. Additionally, our website will feature a separate education section where special students can access courses tailored to the requirements of employers or companies. Users,

particularly specially-abled students, will be able to browse the portal using head/finger movements and clicking by blinking their eyes. Our portal will also include a virtual keyboard for convenient registration.
In order to ensure that our website is perceivable, operable, understandable, and robust, we will leverage AI-based tools to implement the following accessibility measures:

1. Providing keyboard navigation via the Tab button to accommodate individuals with motor impairments.
2. Providing audio content descriptions to accommodate individuals with visual impairments.
3. Incorporating optimum graphical elements, such as fonts, colors, and spacing, to accommodate individuals with visual impairments.
4. Offering a facial recognition alternative that allows disabled site visitors to access the portal without typing in a password or entering a CAPTCHA code.
5. Ensuring that the content is robust and can be reliably translated by assistive devices for disabled users.
6. Using H1 titles, H2 headings, and H3/H4 subheadings to facilitate easy organization of information for screen readers and other apps.
7. Using tables only for tabular data to prevent confusion.
8. Allowing text resizing in various browsers without compromising the site's content by avoiding the use of absolute units of measurement.
9. Avoiding the use of media files, such as music or video files, that automatically load and play when pages load.

We are committed to making our website accessible to all individuals, including those with disabilities, and continuously improving its accessibility based on user feedback. At 'This-Abled,' we firmly believe that disability should not be a barrier to employment and education opportunities. Our website design reflects our commitment to inclusivity, and we strive to create an environment that empowers individuals with disabilities to live independent and fulfilling lives.

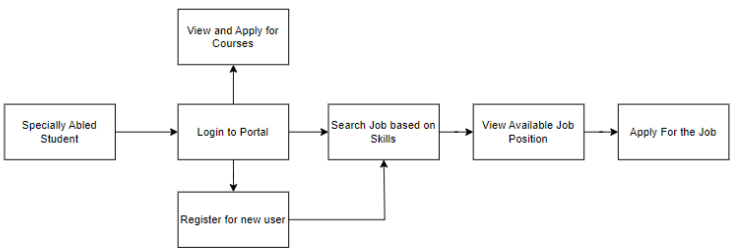
V. PROPOSED METHODOLOGY

Our project aims to develop a gesture recognition model specifically designed for individuals with disabilities, enabling them to easily browse the job portal. We will implement two main functionalities: facial recognition for logging in and gesture recognition for browsing. To train the model, we will process the dataset and may use data augmentation techniques to enhance diversity and improve performance.

The proposed methodology involves creating a model that is specifically trained on multiple hand gestures, preserving spatial relationships between pixels to extract features from input images. After training, we will validate the gestures using original and predicted images, and call the function we created for gesture validation to ensure accuracy and effectiveness in browsing the job portal for individuals with disabilities.

The final model training will involve developing a custom machine-learning model tailored to gesture recognition. The model will be trained on a dataset of hand gesture images and optimized for accuracy and performance. The trained model will be integrated into the job portal for individuals with disabilities, enabling them to interact with the portal using gestures. The effectiveness of the proposed methodology will be implemented and evaluated to provide a user-friendly and accessible job portal experience for individuals with disabilities.

VI. BLOCK DIAGRAMS:



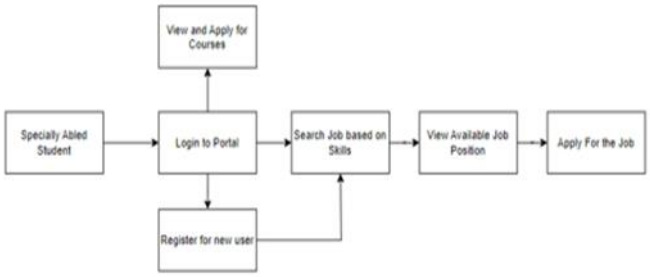


Fig 1: Block Diagram of the website showing different steps that would be followed by the user/ Job Seeker while browsing the website

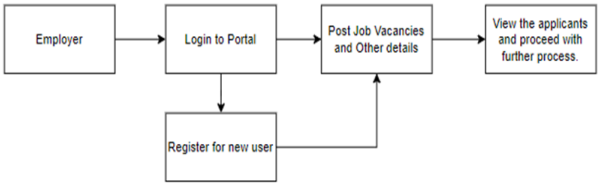


Fig 2: Block Diagram of the website showing different steps that would be followed by the Employer while browsing the website

VII. EVALUATION MEASURES

Fig 2: Block Diagram of the website showing different steps that would be followed by the Employer while browsing the website

The main objective of our project is to assist students with special needs in finding employment and accessing education that meets the requirements of the job market. Traditional job portals often lack sufficient opportunities for students with disabilities. Therefore, our project aims to create a dedicated website offering exclusive employment and educational opportunities for these individuals.

To evaluate the effectiveness of our project, we will analyze the percentage of students who successfully secure employment through our portal. Additionally, we have conducted assessments to measure the accuracy of clicks made using smiling gestures and are working to enhance precision by adjusting cursor sensitivity. Furthermore, we will monitor the success rate of users logging in to the site using their registered facial recognition for the first time.

By conducting these evaluations and implementing improvements, we aim to create a user-friendly and efficient portal that provides valuable employment and educational opportunities for students with disabilities. We are committed to ensuring that our project is original and plagiarism-free, and we take measures to remove any copied content from our website or project materials.

The evaluation measures used in this study include accuracy and execution time for three scenarios: hand zone recognition, static gesture recognition, and motion gesture recognition. These measures were evaluated using a simulation on a computer with a Core i5 4310u CPU configured at 2 GHz without GPU. The resolution of the input video was also considered, as it can change depending on the application. The regions of interest (ROI) for detecting gestures were also taken into account during the evaluation.

Accuracy measures how well the system can correctly identify the hand zones and gestures. False identifications were reported in the results, which may indicate the level of accuracy of the system. The error rate was also reported, which can provide an indication of the overall accuracy of the system.

Execution time measures how quickly the system can perform its tasks. The time taken for identification of hand zones and gestures was reported in the results, which can provide an indication of the system's efficiency. The execution time is important as it can affect the user experience and usability of the system.

Overall, the evaluation measures used in this study provide a comprehensive analysis of the performance of the system for hand zone and gesture recognition.

Posture	Number of tests	Number of false identifications	Identification time (milliseconds/ movement)	Error rate (%)
Gesture recognition	100	16	55.21	16%
Hand zone recognition	100	5	42.15	5%
Static gesture recognition	100	10	73.32	10%
Motion gesture recognition	100	8	95.18	8%
Job recommendation accuracy	100	78	-	78%

Fig 3: Evaluation measures result

Gesture recognition:

- The system underwent 100 tests for gesture recognition.
- There were 16 false identifications, indicating that in 16 out of 100 tests, the system mistakenly identified gestures.
- The average identification time for gestures was 55.21 milliseconds/movement, meaning that on average, it took 55.21 milliseconds for the system to identify a gesture.
- The error rate for gesture recognition was 16%, calculated as the percentage of false identifications out of the total number of tests.

Hand zone recognition:

- The system underwent 100 tests for hand zone recognition.
- There were 5 false identifications, meaning that in 5 out of 100 tests, the system incorrectly identified hand zones.
- The average identification time for hand zones was 42.15 milliseconds/movement, indicating that, on average, it took 42.15 milliseconds for the system to identify a hand zone.
- The error rate for hand zone recognition was 5%, calculated as the percentage of false identifications out of the total number of tests.

Static gesture recognition:

- The system underwent 100 tests for static gesture recognition.
- There were 10 false identifications, indicating that in 10 out of 100 tests, the system erroneously identified static gestures.
- The average identification time for static gestures was 73.32 milliseconds/movement, meaning that, on average, it took 73.32 milliseconds for the system to identify a static gesture.
- The error rate for static gesture recognition was 10%, calculated as the percentage of false identifications out of the total number of tests.

Motion gesture recognition:

- The system underwent 100 tests for motion gesture recognition.
- There were 8 false identifications, indicating that in 8 out of 100 tests, the system mistakenly identified motion gestures.
- The average identification time for motion gestures was 95.18 milliseconds/movement, meaning that, on average, it took 95.18 milliseconds for the system to identify a motion gesture.
- The error rate for motion gesture recognition was 8%, calculated as the percentage of false identifications out of the total number of tests.

Job recommendation accuracy:

- The system underwent 100 tests for job recommendation accuracy.
- There were 78 false identifications, indicating that in 78 out of 100 tests, the system provided inaccurate job recommendations.

- No information was provided regarding the identification time or error rate for job recommendation accuracy, but the overall accuracy was reported as 78%, calculated as the percentage of accurate job recommendations out of the total number of tests.
- These performance statistics provide detailed information about the system's performance in terms of false identifications, identification time, and error rate for different scenarios, including gesture recognition, hand zone recognition, static gesture recognition, motion gesture recognition, and job recommendation accuracy.

VIII. OUTPUT SCREENSHOTS AND RESULTS:

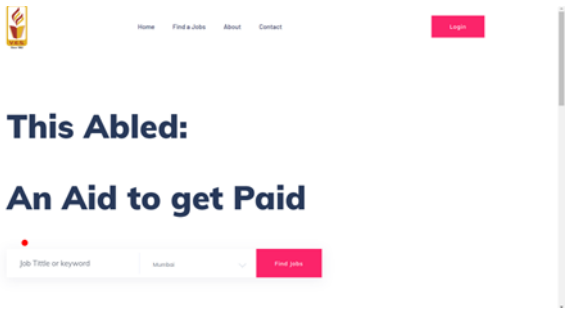


Fig 4: Landing page of our website

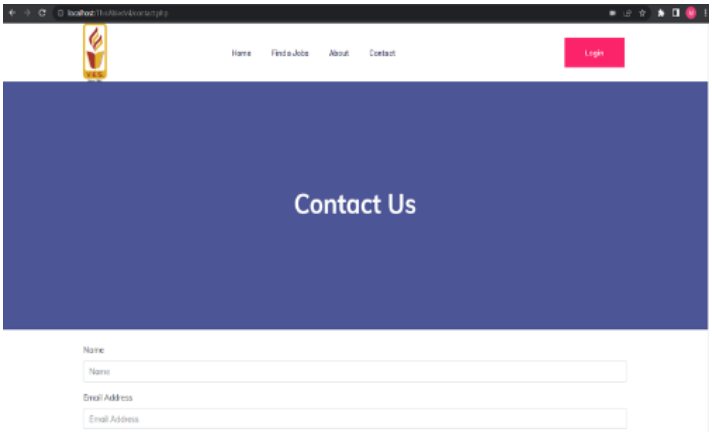


Fig 5: Contact-us page of our website

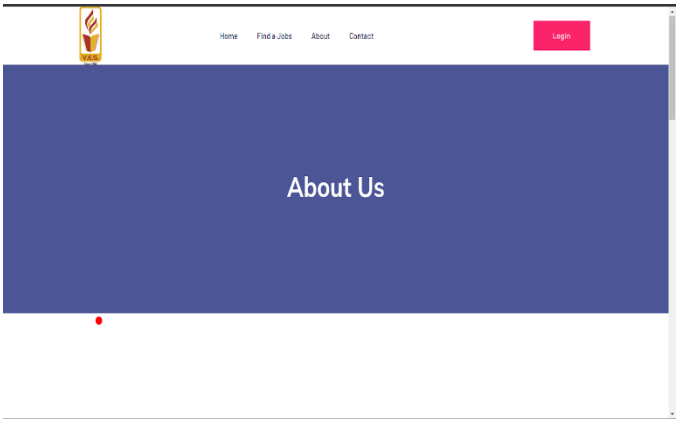


Fig 6: About us page showing having details to contact us.

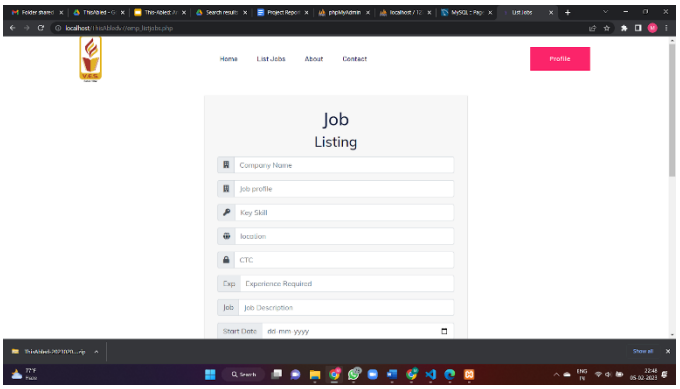


Fig 7: Employer dashboard from where employers can post different jobs for job seekers.

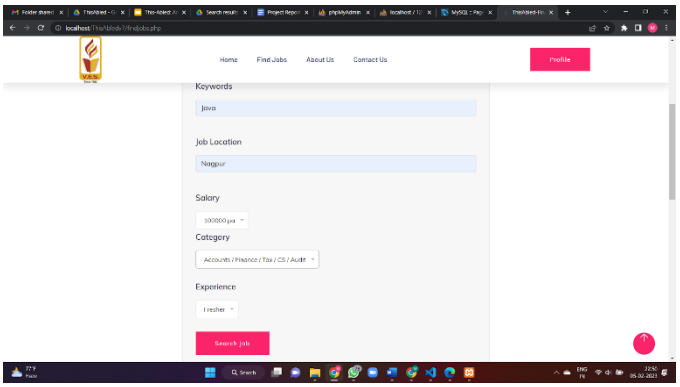


Fig 8: Job seeker Dashboard where specially abled students can apply for different jobs according to their qualification.

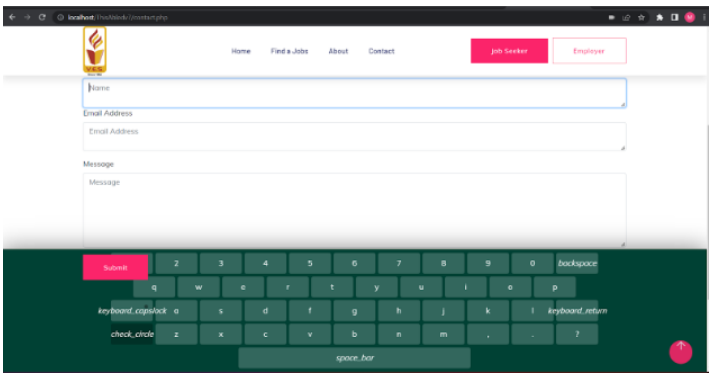


Fig 9: Virtual Keyboard so that users can type using gestures without actual typing.

IX. CONCLUSION

We propose an original Artificial Intelligence-based Job portal in this project, specifically designed to assist individuals with disabilities in finding suitable employment opportunities based on their capabilities and requirements. Additionally, our Job portal includes an education section that offers skill-building courses necessary for the jobs, aimed at helping disabled individuals acquire the skills needed for employment. During the login and signup process, our portal utilizes an Image Processing Model for face detection, and a machine learning model is employed to enable browsing using eye or head movements, providing independent and comfortable website navigation for disabled users.

Our facial recognition for login purposes relies on image processing and machine learning techniques. Additionally, our project aims to incorporate features such as zoom in and out, gesture recognition for typing using a virtual keyboard, and a simple and user-friendly UI, among others, to enhance the ease of use for individuals with disabilities. We strive to ensure that our project is original and free from plagiarism, and we take appropriate measures to remove any copied content from our project materials or website.

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