

Shri Vishnu Engineering College for Women:: Bhimavaram

Autonomous

CARROM BOARD FOR VISUALLY CHALLENGED PEOPLE

1.PROBLEM STATEMENT/RESEARCH QUESTION AND BACKGROUND:

According to the statistics of World Health Organization, around 39.365 million of visually challenged people are present across the globe and of them 8.075 million people reside in India. Most of the visually challenged children play only cricket and chess as a means of their entertainment. Playing games like Carrom Board is a dream for them as they cannot distinguish among the coins identify the pockets and placement of striker. Not many devices are available in the market to enable the visually challenged children play carrom board.

The project aims at making the visually challenged children happy by modifying the physical structure of the conventional board and adding some electronics to it. The lines are grooved in order to place the coins within the marked region and for placing the striker easily. The player strikes the coins using striker and selects any of the region of his/her choice by pressing the appropriate switch. The servo motor beneath the region is activated and turns the region through 45. Where the coins will flip into the tray and count is calculated by using Weight Sensors the proposed board will give audio messages. The project uses an embedded system built around Arduino Mega with weight sensors and SD card interfaced to it.

2.METHODS/APPROACH/SOLUTION CONSIDERED:

Firstly, Setup the carrom Board with all the requirements(coins) and take the respective positions. To start the game, place the queen at the center of the board and place the remaining coins around it.

Player should “on” the start switch to start the game then a welcome note followed by the instructions will be announced through the speaker. The lines for pulling the striker are elevated by using a groove line. The player must start the game by placing striker between the groove lines and strike the coins which are placed at the center

*After player strikes the coins. Player must select the region by pressing the respective button, after selecting the region, the corresponding thread must be pulled then the coins will be flipped into the box, which is placed under the board.

*To place the wins(coins) into the weight box we place a rolling slider which makes the wins to slide into the weight box, by using the weight sensors we will calculate the weight and the total score will be announced through the speaker.

*After that the wins should be removed from the weight box before next player plays the game.

*The same process must be followed by all players from striking coins from respective position until removing coins from the weight box will be continued until coins get completed

3.DESCRPTION OF FINAL APPROCH AND DESIGN:

This project aims at making the visually challenged people happy by modifying the physical structure of the conventional carrom board and adding some electronics to it. Usually, a normal carrom board consists of four pockets and the person will hit the coins into the pockets. By modifying the present board, we came up with this idea that to replace pockets with regions. It consists of four regions which will be flipped with the help of servo motors to place the coins into the tray. The outer structure of the carrom board is made up of teak wood and the inner surface is made up of ply wood.

The lines for putting the coin are elevated by using grooved line structure and when the striker is placed between the lines, they will be able to hit the coins with the help of striker.

The game will get started when the player turns on the start button then the instructions and game rules will be explained after that the person should select respective region where he wants to flip the region for coins to fall into the tray. The red coin is double to the normal coin so it can be identified easily. After the coins are placed into the tray, with the help of weight sensors we will

be calculating the score of each player. After one player has played then after passing the striker to the next player they should rearrange the coins into the center and start playing. In this way the game will be continued.

The 3D model is designed in Catia V5 software. The design of this carrom board is shown in below figures

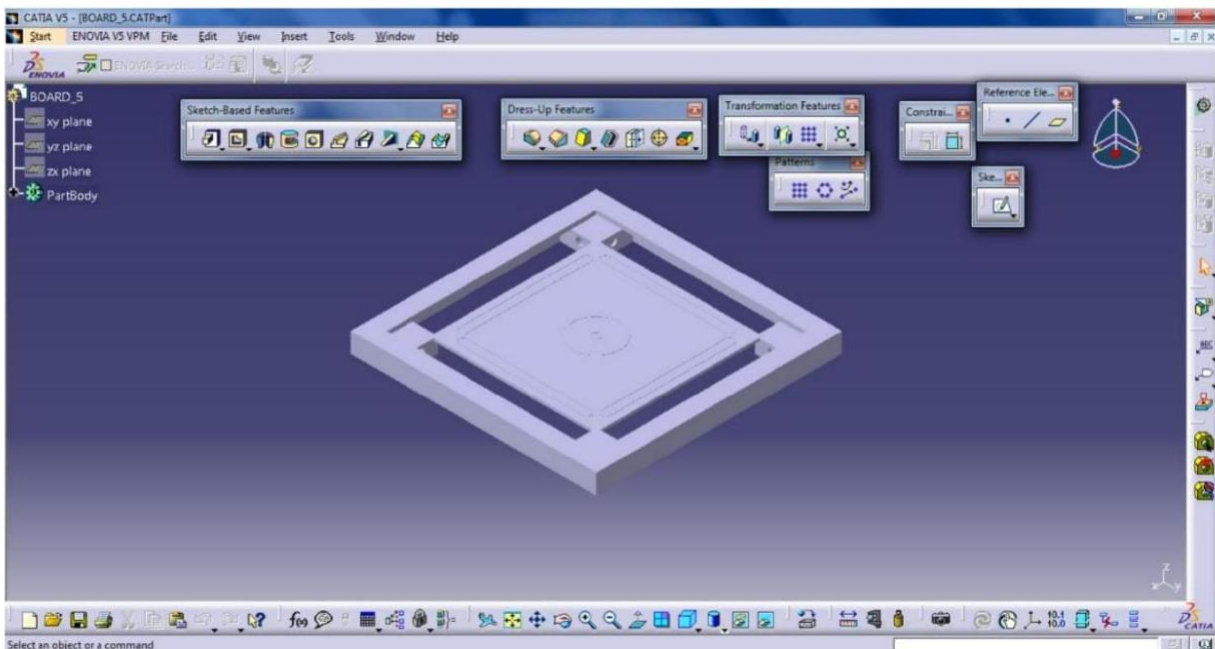


Fig. 1: Design of Board

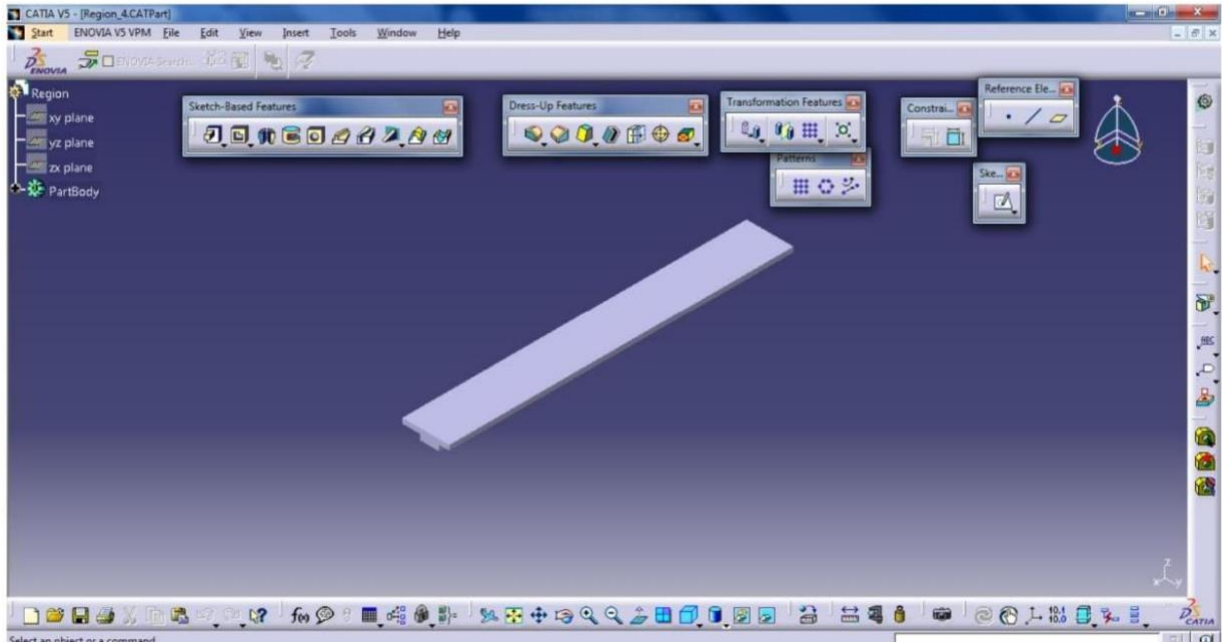


Fig. 2: Design of Region

4.OUTCOME:

We have experienced the play by blind folding ourselves to know how the outcome would be. After blind folded us and we have played the game according to the rules and got confidence that this carrom board will be a game which will be interesting, thrilling and excited to play.

The below figures are the design structures of carrom board.

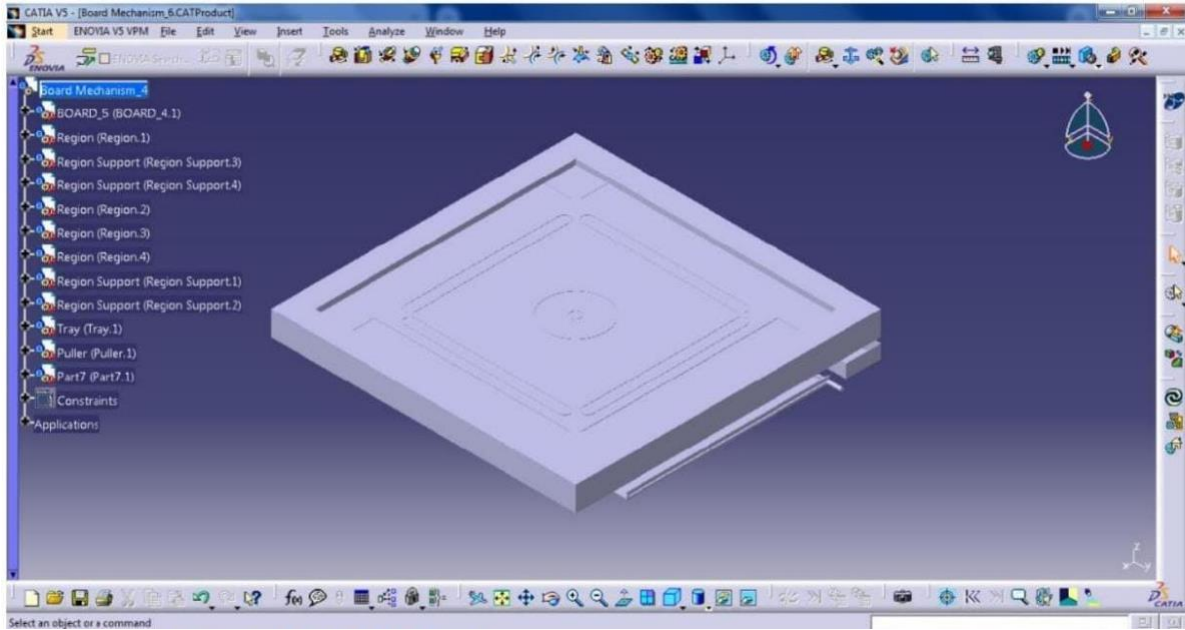


Fig. 3: Final Design of Carrom Board for Visually Challenged People

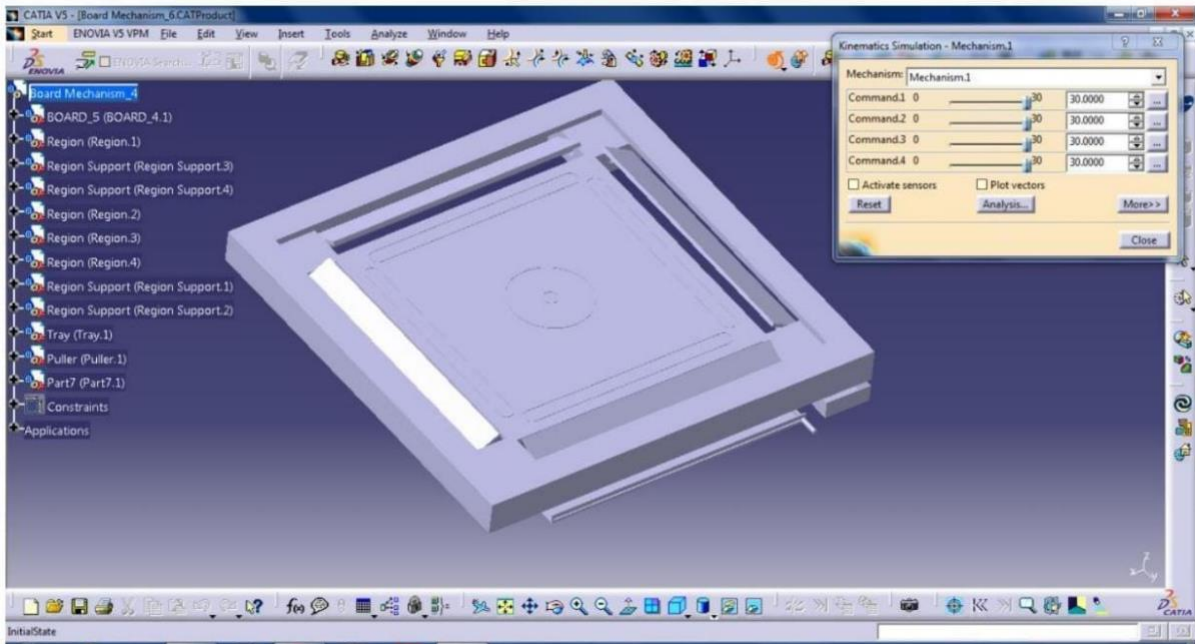


Fig. 4: Carrom Board when all the regions operated to open

5.COST:

The cost of “Carom board for Visually challenged people” is around 7000 rupees but the cost can be reduced by replacing the wood with other types of lightweight materials and size can also be reduced to make the carom board portable.

6.SIGNIFICANCE:

Games helps children to develop social skills such as communication, sharing, waiting, taking turns, and enjoying the company of others in the game. By playing carrom board, players can enhance their focus as game increases attention span on a particular coin or pocket. When playing the game, kids can form some pleasant memories of learning. As we are the normal people, we will experience some entertainment and fun in our life by playing games so we the team aims at making the visually challenged children happy by modifying the physical structure of the conventional carrom board and adding some above mechanism to it. This game will surely increase decision making skills and cognitive skills and problem-solving and helps the brain to retain and build up a cognitive association.

7.ACKNOWLEDGEMENTS AND REFERENCES:

We would like to thank to Shri Vishnu Engineering College for Women (A) management for continuous support. We would like to express special thanks to all mentors & staff of Assistive Technology lab.

Last but not the least, we heart fully thank our clients from various organisations like Centre for Visually Challenged, TTD Deaf & Dumb School, Arunodaya Mano Vikasakendram and Tabitha old age home which are located in and around Bhimavaram for the continuous motivation to develop prototype.

References:

1.<http://www.icfcarrom.com>

2. <https://www.arduino.cc/>

3.www.gmelectronic.com

Assistive Technology Laboratory

The **Assistive Technology Lab (ATL)** in **Shri Vishnu Engineering College for Women (SVECW)**, Bhimavaram, W. G. Dt, Andhra Pradesh is a vision of **Shri K. V. Vishnu Raju**, the Chairman of **Sri Vishnu Educational Society**, to utilize the skills of every engineering department of the college for the development of Assistive Technology. It was set up in 2009 and works in collaboration with University of Massachusetts (UMass), Lowell, USA.

Assistive Technology Lab works for a very unique and a noble cause of designing projects by the students of SVECW to benefit the differently-abled. This is a small but definite step to mainstream people with disabilities into society. Professor **Alan Rux**, founder of the Assistive Technology Program at the University of Massachusetts, Lowell, USA, visits SVECW every year in the month of July and guides students in developing projects related to Assistive Technology.



ATL provides a rich, authentic learning experience for students. It is a real time platform for the students to learn and experience engineering design process, to apply their academic skills in a real-world context, and to develop important workplace skills not usually taught in the classroom. Each project team has to brainstorm and analyze alternative design solutions and justify their chosen design; they must work within a budget, analyze the cost of various design alternatives, and in the end, make a presentation outlining their design work and final solution.

ATL engages students in real service learning, which not only benefits members of their local communities, but also helps students distinguish themselves among their peers in their future endeavours.