

**VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF  
TECHNOLOGY**

**Department of Computer Engineering**



Mini Project Report on

**Brick Breaker Game**

Under the subject: Human Machine Interaction(HMI)

**Submitted by**

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## **1. Problem Definition and Scope of Project**

### **1.1 Problem Definition**

- Brick Breaker Game is a game made for kids with hearing, speaking disabilities which involves movement based controls and doesn't include any voice operated commands.
- It's a game referenced from the classic game that rebounds the ball using a player controlled slide with an aim to break all the breaks in that particular level.
- We aim at building an interactive game to cater to kids recreational needs without using any voice assisted techniques.

### **1.2 Scope of the project**

- Game will be controlled by a Blue Object. This movement will decide the of paddle in the game.
- Game will be a never ending game with unlimited levels.
- Can improve reflexes and responsive ability of kids, which will help them in being more active.

### **1.3 Users**

Admin:

- Exclusive access to repair or improve the game.
- The admin has the authorization of making changes to the game.

User:

- Children above the age of 4. Kids who can play the game using hand Movements.

### **1.4 User Requirements**

#### **Functional**

- To receive real time video feed.
- To apply real time image processing techniques for controlling of the slider.
- Unlimited rounds for the player to play after failure.
- A counter which keeps track of the score the user has achieved.

#### **Non-functional Requirements**


- Properly lit room or surroundings.
- Clear background void of any objects for best experience.
- Major requirements to play the game are proper internet and video camera.

### **1.5 Tools & technologies to be used**

- VS Code
- Python language
- OpenCv for Image processing

- HTML
- CSS
- JS
- Just in mind

## 2. Requirement Gathering and Persona creation



Details

AGE	11
PERSONALITY	Fun Loving
EDUCATION	Primary School

PASSIONATE

EMPATHETIC

CURIOUS

ENERGETIC

USER PERSONA

# Dillon Francis

ABOUT

Dillon is a fun loving 11 year old studying in primary school. He loves to try new challenges and play games. His disability of being deaf causes problems for him while playing these games. His parents also are concerned but his recreational activity's limits. He also likes to try new things and gets bored easily if the game or task isn't challenging enough.

GOALS

- Become a child who is competitive and accomplishes every task he takes.
- Improve his concentration along with recreational activities.

NEEDS

- Looking for a game that challenges him despite his disability
- Have different challenges and levels in the game.

PAIN POINTS

- There are too many games that are just not interactive
- Gets easily bored if not challenged enough.

PERSONALITY

Introvert		Extrovert
Analytical		Creative
Messy		Organized
Independent		Team player

### 3. High and Low Fidelity Prototypes and their explanation - wireframing

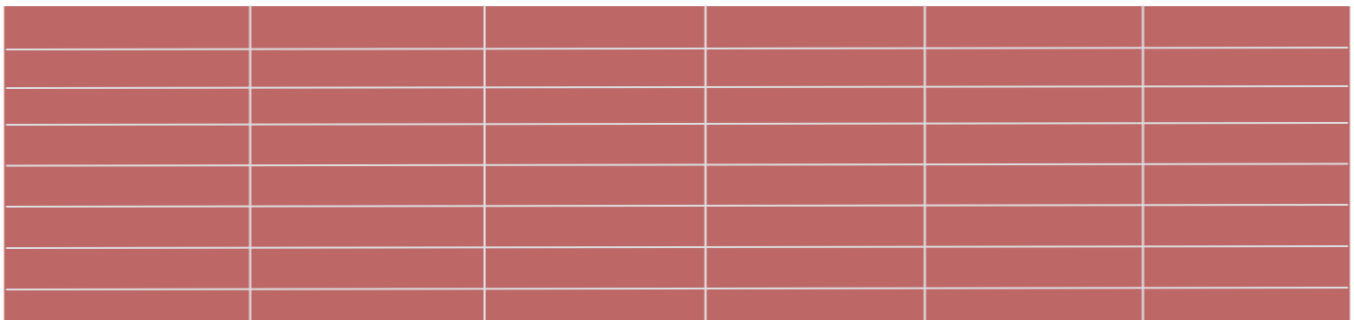
#### 3.1 High Fidelity Prototypes

1. Start Page:

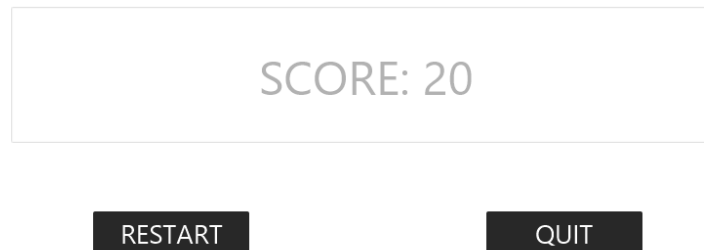
ENTER NAME

START GAME

2. Main Screen

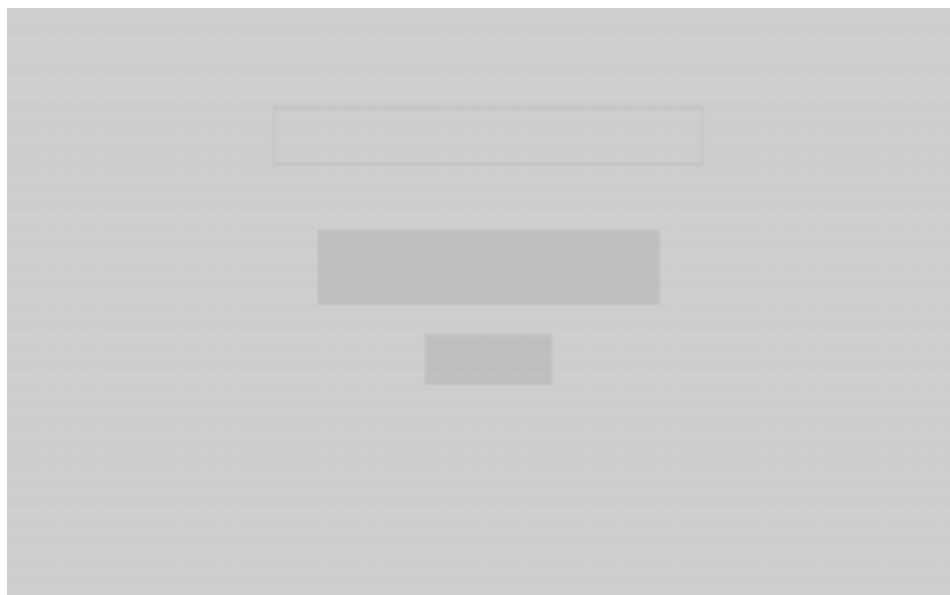


### 3. Final Screen:

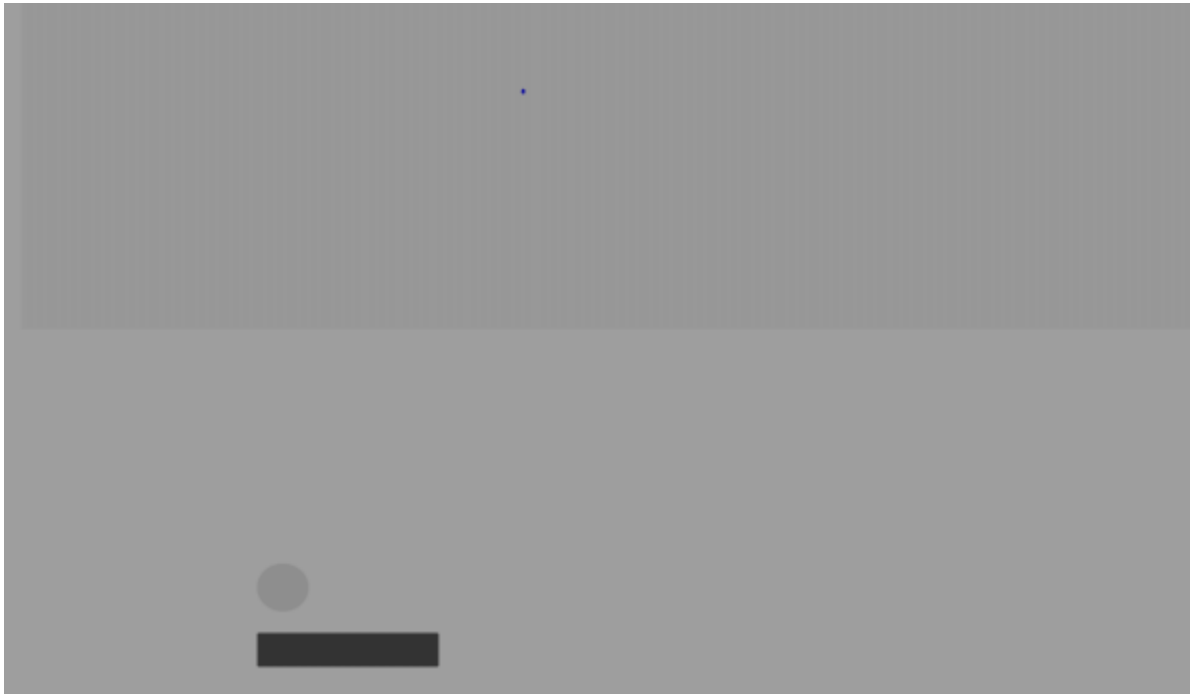


### 3.2 Low Fidelity Prototypes

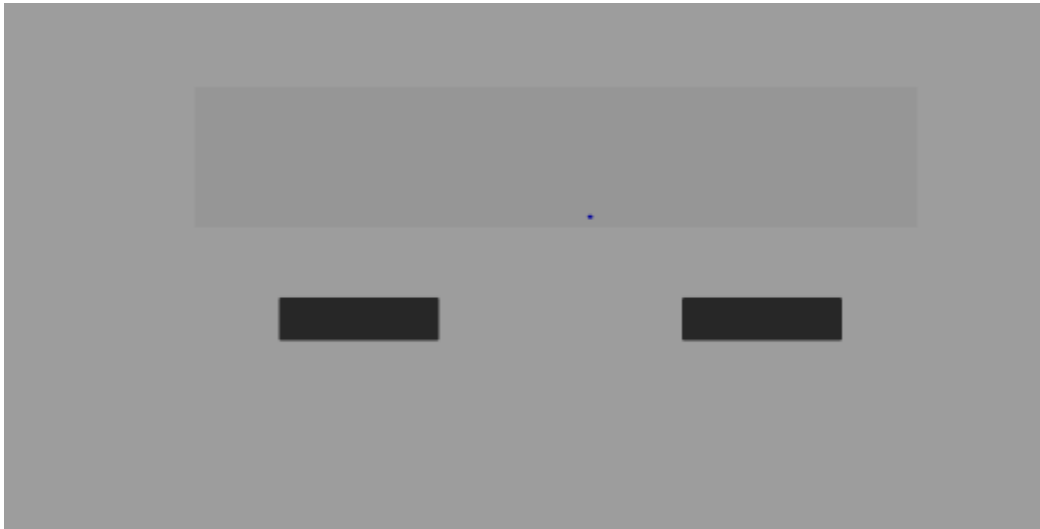
#### Start Screen:



Main Screen:



Final Screen:



#### **4. UI design and Implementation**

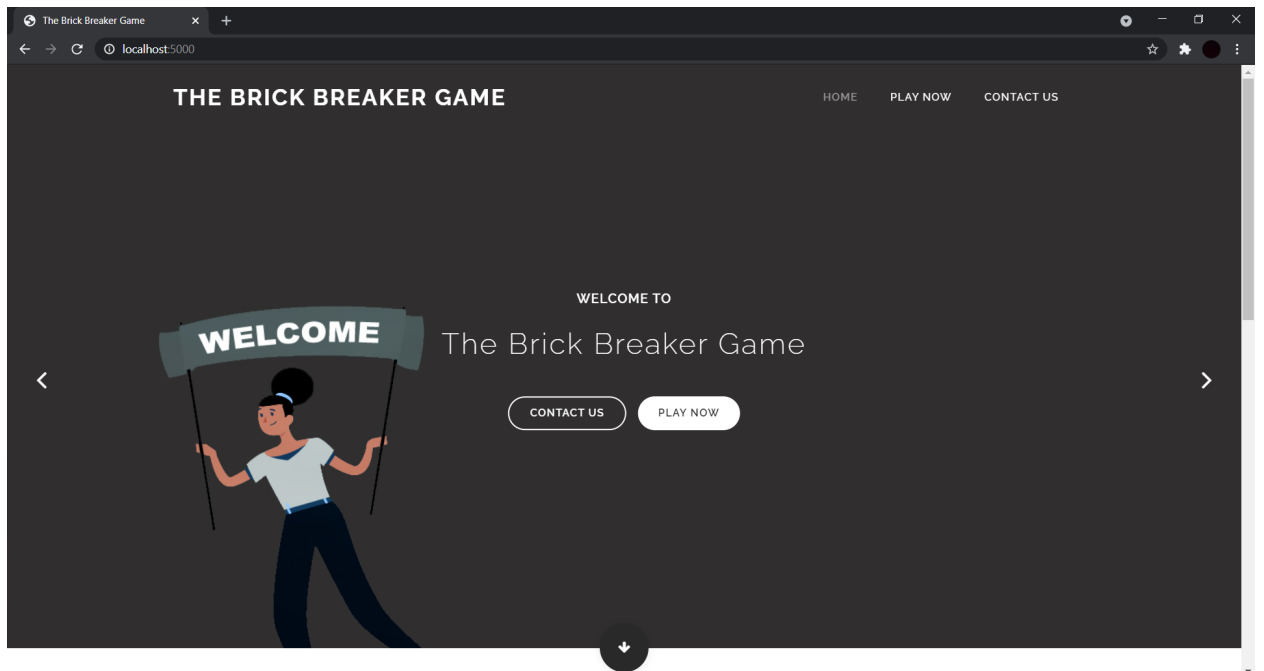
##### **4.1 Application Logo**

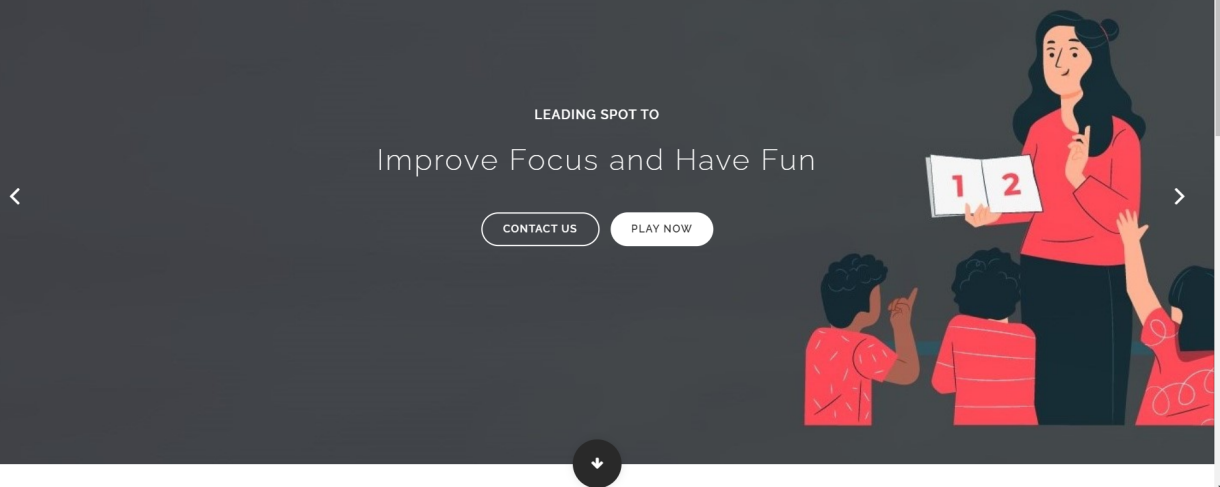
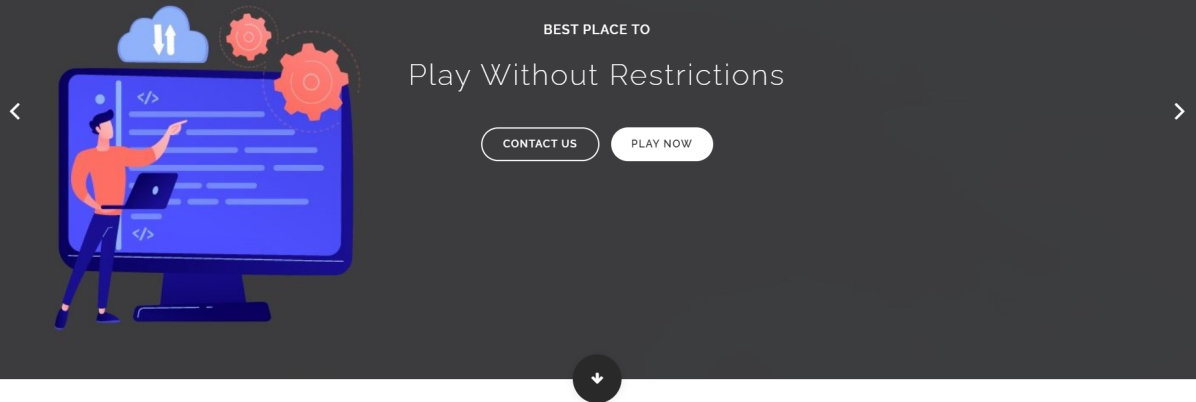
This is a Icon type of logo as they represent what is being offered when people see it. Our logo creates an immediate understanding of what the creator means to express.



## 4.3 User Interaction (Website)

### Home Page







PLAY NOW

## Please Enter Your Name Below

## Instructions

- 1) Hold a blue colour object in front of device's camera.
- 2) The preferred blue colour object should be circular and of more than 25 CM diameter.
- 3) Make sure there are no other blue colour objects other than the one you're holding in your hand to play.
- 4) When you move the object the slider will move in the same direction.

CONTACT US

Feel free to keep in touch with us!

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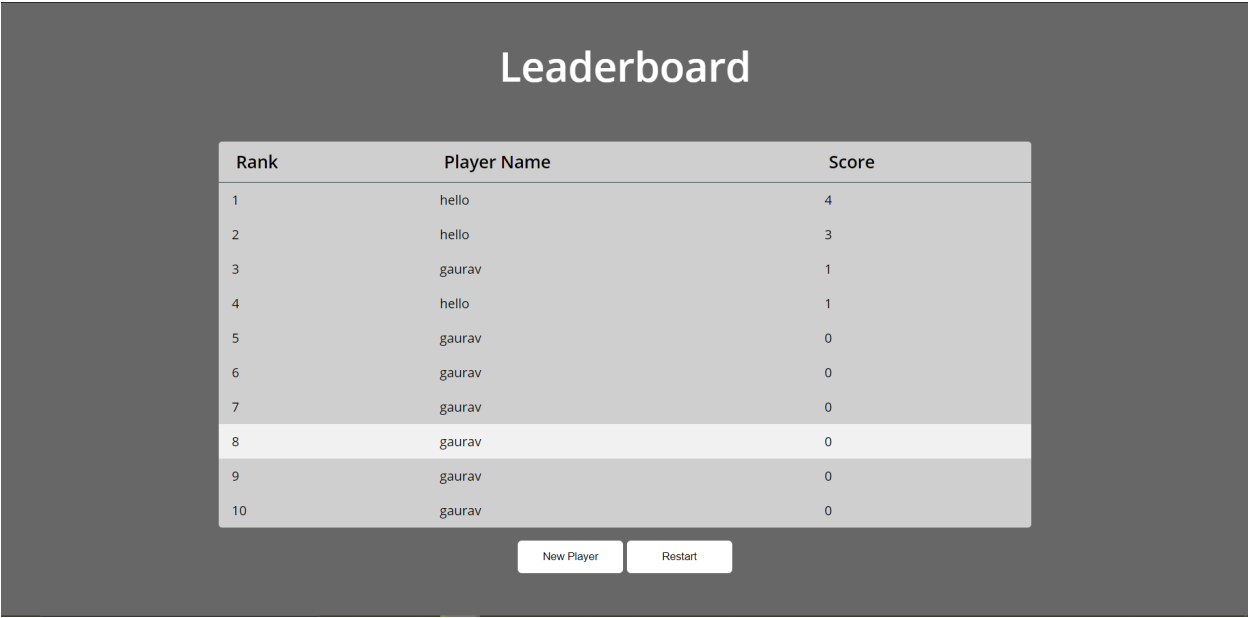
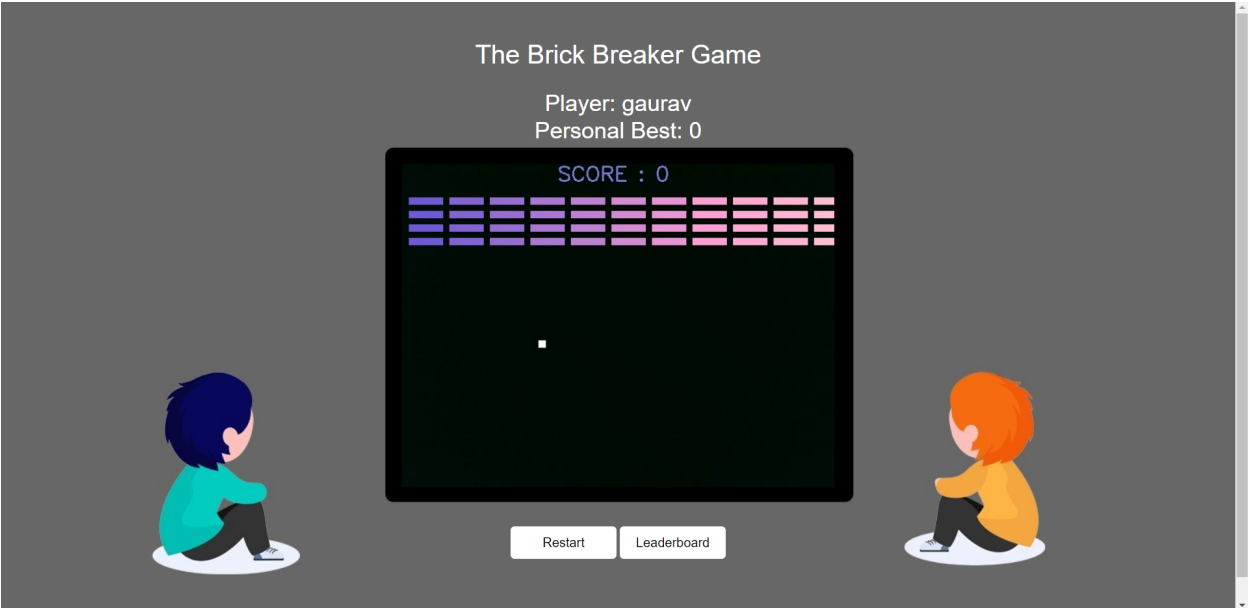


2017.gaurav.marwal@ves.ac.in



www.thebrickbreakergame.com





## 5. UI Evaluation

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Sr No	Group No	Roll No	Name	Visibility of system status	Match between system and real world	User control and freedom	Consistency and standards	Error Prevention	Recognition rather than recall	Flexibility and efficiency of use	Aesthetic and minimalist design	Helps user recognise, diagnose and recover from errors	Help and documentation	Any suggestions
1	23	30	Divya Kalwani	5 ▾	5 ▾	4 ▾	4 ▾	4 ▾	5 ▾	4 ▾	4 ▾	4 ▾	4 ▾	Feature of multiple difficulties will be amazing.
2		48	Drishti Parchani	4 ▾	4 ▾	5 ▾	5 ▾	4 ▾	4 ▾	4 ▾	4 ▾	4 ▾	3 ▾	Variants of ball speed should be included.
3		24	Suraj Gangwani	4 ▾	5 ▾	4 ▾	4 ▾	4 ▾	4 ▾	5 ▾	5 ▾	5 ▾	4 ▾	Different types of background can be used to enhance Experience
4	24	10	Archana Bhatia	5 ▾	4 ▾	5 ▾	4 ▾	5 ▾	4 ▾	4 ▾	4 ▾	4 ▾	4 ▾	Multiple levels should be included
5		12	Mohini Bhawe	4 ▾	4 ▾	4 ▾	5 ▾	4 ▾	3 ▾	4 ▾	5 ▾	5 ▾	4 ▾	Different variance of levels will enhance the game.
6		21	Ria Dharmani	5 ▾	5 ▾	4 ▾	4 ▾	5 ▾	4 ▾	3 ▾	5 ▾	4 ▾	5 ▾	Different difficulty modes should be included.

## 6. Conclusion and Future Enhancement

We made a brick breaker game with more user interactivity by adding live movements as input to move the paddle of the game. We used the OpenCV library to process the live movements of the object. Score is being calculated after each brick is broken. The game adds new level of user interactivity and uses image processing as the core domain. We have made a project that interacts with users on every level and this system can be used by everyone who loves innovation and is excited to enjoy new games.

## References:

- 1) <https://opencv.org/>
- 2) <https://ieeexplore.ieee.org/document/7802081>
- 3) <http://ieeexplore.ieee.org/document/5881671/>
- 4) <https://ieeexplore.ieee.org/document/6240859>