



SOCIAL SKILLS ASSESSMENT IN YOUNG CHILDREN WITH AUTISM SPECTRUM DISORDER

**R. Viniba¹, R. Shanthi Victoria², M. Selva Madathi³,
B. Santhana Bharathi⁴, P. Rishika⁵**

¹Assistant Professor, St. Mother Theresa Engineering College, Tuticorin

²Assistant Professor, St. Mother Theresa Engineering College, Tuticorin,

³3rd Year CSE, St. Mother Theresa Engineering College, Tuticorin

⁴4³rd Year CSE, St. Mother Theresa Engineering College, Tuticorin

⁵3rd Year CSE, St. Mother Theresa Engineering College, Tuticorin

ABSTRACT

This paper presents assessing the children with Autism Spectrum Disorder (ASD) using Augmented Reality based games. These games are brought into the classrooms of students with autism which allowed the children to play with virtual and interactive screen. The aim of this paper is to make the treatment cost effective for those families already paying for expensive therapy sessions. These games are used to understand the unique strengths and weaknesses in the children which help the teachers and parents to handle them. In this paper, we present the games which improve the social interaction and hand-eye coordination.

KEYWORDS: Autism Spectrum Disorder, Communication Skill, Social Interaction.

I. INTRODUCTION

Autism Spectrum Disorder (ASD) is a deep rooted incapacity that can be recognized from the get-go in kids influencing their improvement capacities particularly concerning correspondence and communicating with others. The incapacity has been referred to dialect issues, for example, deferred reactions or very little to speech, perseveration and echolalia. Kids with such disability have genuine impedances with social collaboration and relational abilities[1][3]. Autistic Disorder frequently classified as childhood autism, weakens social, correspondence and creative energy capacities. Autism is related with the word 'spectrum' as range demonstrates that ASD changes between those influenced in view of the range in seriousness of the confusion. Asperger's issue and unavoidable formative issue are characterized under the umbrella of Autism or ASD[2].

As per Autism Spectrum Australia, there are three fundamental essential territories influenced in an individual with Autism[5]. These incorporate, powerlessness to impart, impedance in social communication and confined and monotonous interests, exercises and practices. Social communication is a typical trouble with most mentally unbalanced individuals[4]. They may confront dissatisfaction, uneasiness and hardship with regards to making and supporting friendships. Their comprehension of motions and outward appearances will in general be constrained in this manner causing battle with social and passionate responsiveness.

Austistic individuals may have issues with minding to impart interests and feelings with others as a piece of their conduct. Individuals experiencing Autism think that its hard to speak with other individuals thus PC recreations are utilized in this field[6].

II. EXISTING SYSTEM

Recently, the core concept of designing games for children with ASD was to be used as motivation and coaching on being comfortable with social interaction. The games developed for ASD patients are developed found on the website 'Autism Games'[7].

Traffic rules can be taught through a gaming model to autistic children. This model can be proposed in two different way are visual interface, tangible interface. A visual-spatial concept jigsaw puzzles for ASD children[15]. There are several common medical rehabilitations for autistic children. "Applied Behaviour Analysis" (ABA) is a method to set up an individual therapy using educational approach to stimulate children's behaviour to suit different autistic symptoms[8][9].

Puzzle game is created that stimulate two aspects which are shape distinguishing and spelling. Children will arrange blocks to construct shorts words[10][11]. The shapes are added as clues to assist the children to place the pieces together. After completing the game final results are shown to the children.[12]

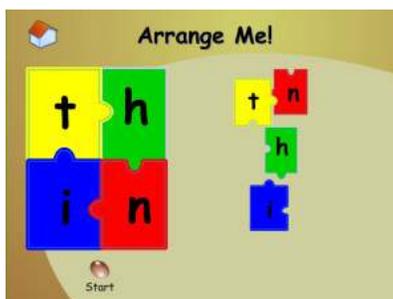


Fig. 1. Puzzle Game

The individuals on the autism spectrum often have difficulties producing intelligible speech with either high or low speech rate, and atypical pitch and/or amplitude affect[13][14]. Over the course of 12 months, we have conducted several pilots to set up the experimental design, developed a suite of games and audio processing algorithms for prosodic analysis of speech. Primer outcomes show our mediation being drawing in and powerful for our members[16][17].

III. PROPOSED SYSTEM

To design instructive remedial and moderate amusements for youngsters with Autism Spectrum Disorder, two increased reality

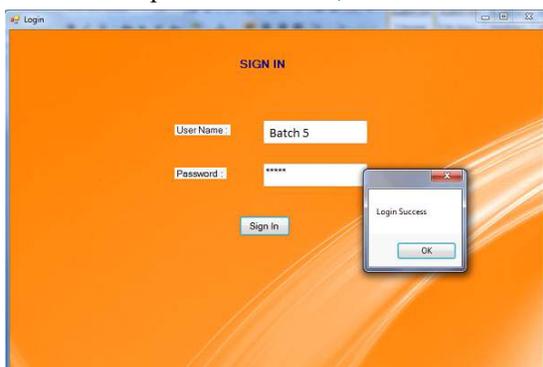


Fig 2. Verification

Fig 2 illustrates the login function of each child. The staff or parent can contain the login information to open the game and starts playing.

A. Memory Game

The game contains 11 levels to improve the memory power of the children. In memory game, a picture will be shown at the first 15 seconds at the left screen then a child will find the correct picture from the collection of pictures which is shown at the right screen. At each level the timer has to be reduced and the collection of picture which is given at the right screen will be incremented using matrix representation.

recreations are proposed in this paper. The point of these diversions is to help kids with ASD to improve social connection and relational abilities. The two diversions are handling the creating social abilities in a typical kid.

The games are:

1. Memory Game
2. Speech Recognizing Game

Both games have been designed in such a way it is easy to understand by the autism children. To get a best result the games required a child-like design that would appeal children between the ages of 8 to 15. This meant the games needed to be designed with bright colors, sounds and known characters. The games are designed using C#. It is an object-oriented language. C# also have the advantage of readable code, modularity and scalable. The Memory Game uses the technique called selection and the Speech Game records the answer in the format of children's voice. Both games contain familiar images or objects. The children with ASD can easily understand the game with the help of employed staff. The games are designed to improve the comfortable environment of each child with ASD. The games are used to develop social interaction and hand-eye coordination through simple instructions and concentration.



Fig. 3. Types of games

Fig 3 illustrates the types of games to be chosen to play. The parent can select the game according to the capacity of the children.

A child can find the correct picture and displays star (Score) to improve the interactivity of the game, otherwise the game will be repeated until the correct picture to be found. The time taken by each child is stored in a database. After finishing the game it has been verified by the staff and parent in order to monitor the variation of memory level. By using this we can frequently monitor the autism level of the children. The more training can reduce the autism level.

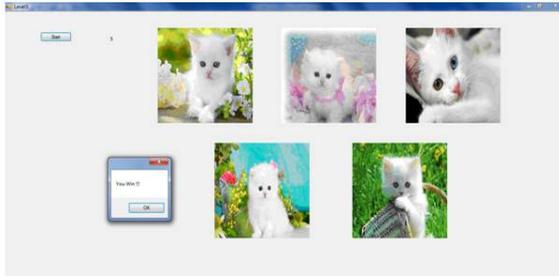


Fig.4. level 3

The Fig.4 illustrates the level of memory game. Here the cats are used as display picture. Also the children can understand the cats.



Fig.5. Score Card

The Fig 5 illustrates the stars, that is a score card for the children and it makes the game more interesting.

B. Speech Recognizing Game

The speech recognizing game gives the audio of the input emotion and a child has to speak the exact word with voice through mike. After receiving a child voice the game will provide the output emotion in words. The word must be in grammatical pronunciation. Through this the staff can understand the speaking

capacity of each child. Here there are five levels to improve the speaking capacity. The stars are used to encourage the children and it is like a score card. The children should pronounce the words correctly. Otherwise, repeat the process. This can implement the children to speak in some more days. The input emotions are used in real time.

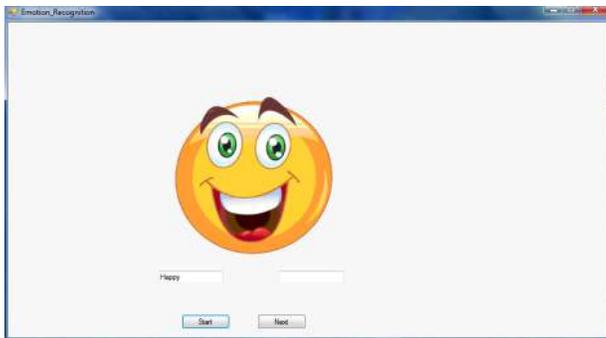


Fig.6. Level 1

The Fig 6 illustrates the emotion of emoji and different emotions can be studied by the children through the staff or parents.

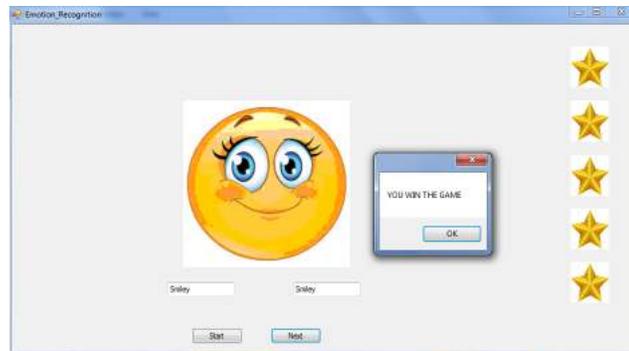


Fig.7. Score Card

The Fig 7 illustrates the score card of each level and stars are used to encourage the children's interaction.

C. Performance Representation

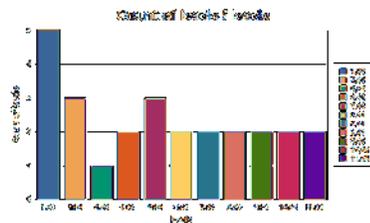


Fig.8. Performance Graph

The graph represents the performance of each child. Here x axis represents the number of levels and the y axis represents

number of attempts in each level. Using this graph the staff can understand the entire performance of the children.



IV. CONCLUSION

The paper presented two games are used in Autism Spectrum Disorder therapy sessions and focusing on memory power and speaking skills. The games were developed using C# language. The memory game can be implemented in a projector to improve the interaction. The speech recognizing game has the ability to make them speak. The children have the better social skills interaction through the games.

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