RESEARCH REPORT ON

AI For Autism - Uses of AI to Give A Better Life to Autistic Children

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of Bachelor of Science in Computer Science and Engineering

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I hereby declare that, this research has been done by me under the supervision of Md**. Sazzadur Ahamed, Senior Lecturer Department of CSE** at Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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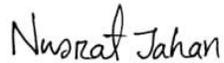
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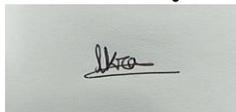
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ABSTRACT

The 21st century is called the age of artificial intelligence, there is no sector where we do not use artificial intelligence, food, shelter, even in the medical sector, and artificial intelligence has radically changed our world. The constant use of this technology is making our standard of living much easier. In addition, every day, this technology is developing new systems and informing society and the world about novelty. Artificial intelligence is like a human being. It is capable of thinking, and as a child learns everything by looking at new things after birth. At present, this machine learning technology of artificial intelligence is very popular and its use is very much all over the world. This technology is used in agricultural banking, factory management, policing, and education, and even in the medical sector. Autism is a big challenge for our society today. An autistic child is considered a burden to family and society. An autistic child has to deal with all kinds of problems in a family. An autistic child needs to be monitored at all times. Recently, computer science (AI) has emerged as a promising alternative. Built to support the biological networks of the human brain, AI includes a good range of technologies capable of performing cognitive functions by mimicking human intelligence. While committedly moving toward other areas (e.g., engineering, business, and everyday applications), growing efforts are being made to include AIK in the diagnosis of Autism Spectrum Disorder (ASD). Previous studies of (ASD) have applied AI in recognition of structured or structured or structured data supported symptoms, classification, diagnosis, and outcome prediction.By searching for 'Autism' and 'AI' in very computer programs, one can easily find a phone application that advertises the use of AI to detect autistic features. Autistic children need a device or system that is fully customized and set up as needed. Because not all autistic children are of the same type. There are different types of autism, since the type is not the same so one system will not apply to everyone. Therefore, a customized system or device development needs to be done so that parents can customize the device or system according to the needs of their autistic child's may provide inaccurate information and cause unnecessary delays within the provision of care. Our team BEE created an idea to create a device based on AI for Autistic children to make their daily life better, easier, and comfortable. By recognizing facial expressions, this device is capable of understanding emotions, hunger, toilet pressure, and informs their guardian. It observes the person and alerts their guardian for any kind of danger like self-injuring, harmful activity, fire, and any kind of accident.

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CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

Autism Spectrum Disorder (ASD) can be a neurodegenerative disorder characterized by difficulty communicating with limited or repetitive patterns of social communication and behavior, interest, or activity. [1] Depending on the behavioral observations conducted [3]. The reliability and validity of these results is questioned when accounting for subjectivity, [4], which may arise from differences in professional training and experience [5], lack of resources [6], or cultural adaptation of assessments. Such a limitation of this diagnostic requires the development of a single method that can provide a quick, accurate assessment with a clear understanding of the different phenotypes in each individual with ASD. Recently, Artificial Intelligence (AI) has emerged as a promising alternative. Based on the biological networks of the human brain [7], AI has various technologies capable of mimicking human intelligence to perform cognitive functions [9] in other fields (e.g., engineering, business and everyday applications) have shown promising results. Increasing efforts are being made to do so [10] Previous studies have used AI based on structural or structural data [12], classification, diagnosis [9, 10], and outcome prediction [9, 10, 14]. Equipped to improve accuracy through testing, AI can also reduce the possibility of inevitable human error [10]. For example, AI is capable of capturing data that may not be visible to the human eye during behavioral observation, which may be precise data-fiction [15]. With the growing interest in AI, the movement to make such programs accessible to the public has begun. For example, by searching for 'autism' and 'AI' in search engines, one can easily find a phone application that advertises the use of AI to identify autistic features. However, without sufficient evidence to support their validity and reliability, such programs may provide accurate information and cause unnecessary delays in the provision of care.

One of the most used subfields of AI in the study is machine learning (ML). Machine learning educates itself with a labeled dataset and adopts a supervisory approach by creating the best fitting algorithm to predict an observable method of analyzing input features by cutting patterns without any results of interest or prior knowledge [1]. By creating useful models and complex models that transcend human performance in the analysis of large datasets [11, 17], ML can increase our perception of ASD and help build a stronger foundation for better screening and diagnosis. To develop a more objective approach to ASD detection by evaluating related notable features, previous studies have attempted to use the modal in different ways with AI. For example, ASD is

likely to be involved in the interplay of several genetic biomarker variants, [18] and genetic research has been applied to several AI methods to explore and optimize ASD risk-related gene candidates. The current combination of genes is capable of explaining only a small part of the case. [20] Based on the population and the models used, predictive neuroanatomical probes have become inconsistent. [22] However, behavioral monitoring data faces numerous challenges when it comes to gathering information based on actions or subtle responses to social situations and their interpretations by administrators. Since ASD assessment relies on observational data and seeks to use AI to independently retrieve information from the environment, a combination of these two factors may help overcome the limitations of data collection during screening and diagnostic procedures. One of the most used subfields is Machine Learning (ML). Machine learning educates itself with a labeled dataset and adopts a supervisory approach by creating the best fitting algorithm to predict an observable method that cuts patterns without any results of interest or prior knowledge [1] 11, 17] By creating useful models and complex models that go beyond human performance in analysis, ML can increase our perception of ASD and help build a stronger foundation for better screening and diagnosis. Evaluation of significant features associated with this disorder In order to develop a more objective method for detecting ASD through, previous studies have tried to use the model in different ways with AI. Genetic research for optimization in several AI methods the [19] limitations continue, as the current combination of known ASD-related genes is only able to explain a small part of the case [20]. Which may differ from ASD unique unfortunately, based on the research population and the models used, predictive neuro economic probes have become inconsistent.

Despite research studies on how AI can be used to establish a data-driven approach to ASD classification with biomarkers, the current system relies heavily on behavioral observational data. Observational data faces numerous challenges. Unlike genetics and neuroimaging scans that have a well-established flowing protocol for collection and analysis, there is no objectionable system for capturing constant changes in an individual's behavior. Since ASD, evaluation relies on observational data and attempts to use AI to retrieve information independently from the environment, a combination of these two components can help overcome data collection limitations during the screening and diagnostic process.

While reviewing surveys such as Hyde et al, While and Thatch reported ASD studies focusing on a single AI method, to our knowledge, there is no literature on the widespread use of AI technology

to differentiate individuals with ASD by emphasizing behavioral aspects. The review was not conducted. Therefore, the purpose of this study is to provide an overview of how AI can be implemented in the current assessment process and other potential behavioral aspects That can be used to enhance ASD detection skills.

1.2 Motivation

In 2000, 1 in 150 people were diagnosed with ASD. Autism is a disorder that is affecting more and more people. Autism is a social crippling disorder and it is a huge stress in the families caring for these people. Thus, there has been a need to develop AI technical support for the diagnosis and monitoring and care of an autistic child.

Therefore, we decided to create an idea for developing AI technology for autism. To monitor their heart rate, anxiety level, mood swings, their preferences, harmful situations they may face, hunger and toilet pressure and other activities such as sleeping parents. Provide edge computing nodes and data virtualization to understand data stream from patient wearable.

A family faces huge problems when they have autistic children. It is very difficult for ordinary people to monitor and take care of an autistic child around the clock. Therefore, we decided to come up with an idea to create an automated wheelchair for an autistic child using AI technology. Are either hungry or have toilet pressure or when they feel safe and happy and do not recognize their expression. It will always monitor the baby. In addition, children will warn their parents when they face any difficulties.

1.3 Objectives

The main goal of our study is to develop technical aids, which help to identify an autistic person early and initiate early intervention to manage autism. For example: In their home, we will monitor their heart rate, anxiety levels, mood swings, and other sleep patterns with the help of edge computing nodes and data virtualization to understand acceptable data streams from the autism patient's wear. This can help practitioners improve their teaching skills. Smart Edge nodes equipped with self-organizing coordination capabilities act as lower-agency clinical tools; they

will make smart decisions that support the identification of anxiety problems locally that are useful for the clinical priorities of the person with autism. A real-time SMM (stereotypical motor movement) detection system can also be created to search for behavioral clues from the data. Alternatively, AI ultimately allows these devices to live in anthropomorphic features and conduct natural, human-sounding conversations. Numerous applications will be developed on devices that will help autism patients improve their speech. Computer science can play a terribly important role in advancing the growth of autism diagnoses, human friends and practitioners. Technologies such as data virtualization will help explain the data streams of wearables in real-time and ensure the security and privacy of health information. Computing will help us work faster. In fact, AI can probably achieve more results than we have before in terms of understanding human behavior, this is an exciting time for all of us.

1.4 Expected Outcome

We want to develop a system that can improve the quality of life of autistic children, many companies have already created a variety of systems, robots, and apps using AI technology, which has been able to bring a lot of changes in the lives of autistic children, but each system has something There are some shortcomings, if you can correct them and bring innovation in them, it will be much more useful for autistic children. So, we thought of a system development that would be a combination of all systems, apps, and robots. Which will bring a new chapter in the lives of autistic children. Neuroscience and AI robots will help us understand the behavioral formulas of a person with autism, virtual assistants are ready to help enhance their speech, and Edge Computing will help us work faster. Indeed, in understanding AI human behavior we can be the best at achieving more results than ever before. Computer science can play an important role in advancing the growth of autism diagnoses, human friends, and practitioners. Technologies such as data virtualization will help explain the data streams of wearables in real-time and will ensure the protection and privacy of such national health information. Therefore, from this angle, we come up with an idea to create an automated AI technology. It will be an automatic wheelchair, ready to monitor autistic children for at least a while and alert their parents if they encounter any reasonable difficulties. This will make life easier for them and their families. That can be used to enhance ASD detection skills.

CHAPTER 2

BACKGROUND

2.1 Introduction

We first thought of this research when we need to do final year research. We thought of many themes, but after much thought we chose to work with autistic children. Because autistic children are neglected by society, and our society feels the burden of autistic children. That is why we have made it a priority to work with autistic children. To do this research, we first need to know about the quality of life of autistic children, and their problems and needs.

Autism is a disorder that is affecting more and more people. From the mother's womb until a few years after birth, the baby's nervous system continues to develop. If the development of the nerve is hindered for any reason, the child may have autism.

2.1.1 At this stage, we have to learn about the lives of autistic children and their problems and needs. How to understand a child with autism:

If seen:

- At the age of 6 months, the child does not laugh alone
- At the age of 12 months, he is not able to say half a bowl, not pointing to the object of his choice
- Can't say a word in 18 months
- At the age of 24 months cannot express the mind with two or more words
- After mastering the use of language, forgetting again
- Not doing age-appropriate social behavior

2.1.2 There are two types of special features in a child with autism:

- Difficulty in forming social relationships and communication problems with the surrounding environment and person.
- Doing the same thing over and over again

Individuals or children with autism cannot socialize, share their interests, passions and feelings with others, take no initiative on their own to start any kind of social relationship and even if they can talk, keep talking to others. Fails to go. Some people cannot speak properly or utter any meaningful words at all. Does not respond to calls by name, does not look into the eyes and does not change the face according to the environment, that is, if you are scared or happy, you cannot understand by looking at the face. Children with autism do not play with imagination. For example, he cannot think of himself as a character or play as a car or a plane. They cannot make friends easily and their interest in others is lessened.

The same behavior can happen repeatedly. Such as clapping hands, rolling on the floor, repeatedly twisting fingers. Never use an object in the same very repeatedly. Such as turning the wheel of a toy car repeatedly, never uttering the same word repeatedly. People with autism who can speak are seen asking the same question repeatedly or asking the same question repeatedly. For example, if he is asked, 'What is your name?' He does not say his own name — 'What is your name? What is your name what is your name? '- Children with these characteristics like to follow routines or patterns, get angry or upset when routine exceptions are made. Sometimes there is a habit of repeating the same thought or the same thing repeatedly, sometimes creating an extra attraction towards a particular object. Wants to collect such toy cars, glasses, pens etc. Responds abnormally to sound or touch. Just as a few words frighten you or you don't respond to a loud voice, so a little touch hurts or makes you feel uncomfortable, and vice versa.

When is it disclosure, because what:

Autism is a disorder that is affecting more and more children. No specific cause of autism has been found. However, some factors are considered as a risk factor for autism. Such as: Autism problem in the family, maternal infection during pregnancy (rubella, measles, mumps), low birth weight baby, breathing in toxic lead air during pregnancy, any complications during childbirth, maternal and child malnutrition problems.

Problems that may exist:

Children with autism may have seizures (epilepsy), hyperactivity, lack of intelligence, complications with handwork, digestive problems, dental problems, not chewing food, etc. According to the latest survey (published in 2016) conducted by the US Center for Disease Control and Prevention (CDC), 1 out of every 59 children has autism. Boys are about 4 times more likely to have autism than girls are. The rate of autism has increased almost 10 times in the last 40 years

worldwide. The main reason for this is that the definition of autism has changed repeatedly, resulting in an increase in the scope of autism.

Some common features of an autistic child:

Not all children with autistic spectrum disorder have the same symptoms. Some suffer from severe intellectual disabilities; someone may have limited that ability. However, some features of autism are detected in autistic children from a very young age (2/3 years). In the second episode, I learned that there are three main areas of child development; let us give an example based on them.

1. Social interaction

When a child is called by name, he does not respond, nor does he look back. He may not understand the name, he is completely indifferent. On the other hand, hearing the call and realizing that the work or game he was busy with stopped for a while; but do not look back at the caller. Parents or relatives who are seen regularly do not look at the eyes. Even if you go to him or try to take him in your arms, you can see that he is taking his eyes off very quickly. Eye-contact disability is most evident in autistic children.

Does not want to mix or play with children of the same age. Seeing other children playing, he moved to one side. Shows reluctance or annoyance to see what others are doing or to take part in their game. Most autistic children are seen to be identified as "unhealthy" in the family environment before diagnosis.

He does not share any kind of pleasurable object or subject with others. Usually children want to show a toy to everyone when they get it. Talking or attracting the attention of others, but in the case of an autistic child, even if he has some interest in such a toy, there is no excitement about it. Normal babies like to climb on someone's lap or get a hug. However, many autistic children are indifferent to this. They do not like to be in contact with anyone else.

2. Communication

The ability to communicate with the environment and the environment is supposed to develop naturally with the development of the child. In the case of an autistic child, the ability to make this communication is reduced - it is seen that autistic children of the same age cannot utter the words

that normal children can utter at the age of 2 to 3 years. Then the parents can understand the matter by comparing it with other children of the same age.

In some cases, the autistic child may be able to speak normally, but it is unusually late to start a sentence or not be able to finish it once the sentence has started. It may be that even at the age of 3-5 years, he cannot form a sentence with more than two or three words. The matter of one's needs is not in the good man (first person) but in the name of the man (third person). For example, saying 'I will eat' does not mean 'Baby will eat'. I cannot say anything beyond a few words from the rhyme I have heard many times. For example, he goes on to say, "That's why Mama goes home / Mammy gave her milk and rice to fill her stomach / Mama came running away with a stick." Or 'income moon tip yam' etc.

Children may show a tendency to repeat the same word or phrase over and over again. These words may or may not make sense. If an autistic child is asked, 'Will you drink milk?' Way, either the same word or phrase keeps repeating. The child keeps repeating the same thing over and over again without answering the question of why he is saying the same thing over and over again, or what the meaning of those words is. Parents do not listen, but are upset, angry, or start to cry out of frustration at not being able to express themselves.

Children 3 years of age and younger spontaneously create their own age-appropriate games. Although they cannot speak in that way, they indulge in imaginative play through gestures and hiccups. However, autistic children do not. They cannot play any imaginary game with dolls, cars, stuffed animals (teddy bears, Mickey Mouse, rabbits), etc.

3. Behavior

Autistic children tend to repeat certain types of behavior. Maybe shake hands or move fingers. Turn the toy box upside down and take out the toy (small ball or marble); Inserts again. Takes it out again, puts it in again. It goes on like this. Some children want to play with household items. In that case, it is seen that he is pouring salt from the saltpan and putting it in the bowl, again taking it in the previous place. On the other hand, pouring water from one glass to another with two glasses. They spend a long time in this repetitive work; it can last for a few hours. Family members are usually relieved to find that the child is (accidentally) calm. Many autistic children do not like

sounds. Feeling uncomfortable talking loudly or watching TV, crying or screaming. They love to follow routines. With the exception of the kind of daily life, he is accustomed to, autistic children get upset, cry or scream. When he leaves home and goes somewhere else, he is uncomfortable. Almost all children have a habit of washing their hands and face before going to bed at night, changing their clothes and going to bed, but when this happens, ordinary children do not remember anything, but in the case of autistic people, they react in some way. They cannot tolerate any change in the surrounding conditions. Suppose the position of the furniture in the house is changed. This is his strong reaction. They have to take off their clothes to take a bath, or put on new clothes instead of the ones they wore before and after the bath; they cannot accept these simple changes. He sleeps with the windows open in the summer, and after getting used to it, he reacts to the sound of closing the windows in the winter. Alternatively, she cries or screams at the sound of the bedroom door closing while she sleeps at night. The matter of this reaction goes on for a long time. Because of such reactions, many autistic children are initially considered "stubborn" in the family. He has an extra attraction towards certain toys or ordinary objects. He always wants to keep it with him. However, the feature of it as a toy does not attract him. For example, some children are not interested in driving a toy car, but they can be seen turning the wheels with their hands upside down. Most autistic children grab a pencil or pen. You cannot hold a pencil with two fingers or with a three-fingered pencil. Before learning to wash or wipe their hands, children learn how to wash or cool their hands by watching adults. However, autistic children cannot master these simple things. Even after teaching, it is seen that he is washing his hands and swaying like a wave, he is not able to shake in such a way that water will flow. Even if you can wipe your hands, the towel is holding in such a way that it is not being wiped properly. They have many problems in fine motor activity. When someone points with a finger, the child looks at the finger, not at the object. This is due to the lack of coordination capacity of the motor nerves. The autistic child must have problems with the motor nerves. The motor nerves control and coordinate the various organs of the body while performing any task. It is for this nerve that it is possible to be able to stand on one foot with balance, to be able to throw something at specific targets, to be able to stumble, and so on. Some autistic children suddenly become angry or frightened for no apparent reason. Twentyfive percent of autistic children may have seizures. Any of the above symptoms may be present in normal children for a temporary period. Therefore, it would not be right for parents to consider their child autistic just by seeing a symptom. In addition, not all of the above symptoms will coexist in an

autistic child. Again, parents need to keep this in mind; some of these symptoms are seen in the child for a long time. If so, you must seek the help of a specialist.

We went to the school for autistic children and wanted to know about them, our questions and the answers of the doctors and teachers directly I am presenting the paper:

1. Will they ever be able to return to normal life?

Answer: They fail to lead a completely normal life. However, by modifying their linguistic, social and behavioral problems, their way of life can be brought under normal control. They cannot live like normal children due to poor intelligence and sensory problems.

2. Will they be able to do the things of daily life?

Answer: If they are taught daily life tasks through routine work, they can do them. In this case, they can be taught using pictures or videos. Work such as brushing teeth, eating, going to the toilet, taking a bath, washing hands, wearing shoes, making the bed, etc. can be taught to them by showing them picture cards or with the help of story books.

3. Will they be able to study?

Answer: Among autistic children, those with Asperger's or High Functional Autism, that is, those with low autism, often show the same abilities as normal children. In many cases, some people's reading skills are better than normal children are. Low-skilled autistic children or severely autistic children have a variety of learning disabilities due to learning disabilities.

4. Can they be sent to ordinary schools?

Answer: Children with mild autism attend general school. From personal experience, I have seen that these children are taking SSC exams on the same question paper as normal students. In addition, many such children are studying very well in ordinary schools. However, those who have

sensory problems, they have to keep an eye on someone special in school. Emphasis is now being placed on an integrated education system around the world to ensure the quality and rights of their education.

5. What could be the role of parents and family in their lives?

Answer: Autistic children have an impaired nervous development, and parents need to be strong and tolerant, without panicking and avoiding trauma. The first and foremost refuge of a child is his mother and father. Their positive attitude towards the child is essential for their overall wellbeing. If the parents are positive, the family will be positive and this positivity will help to make the attitude of the society positive. Autism is not a contagious disease, autistic children are not the object of panic! Please change the mindset. This will increase the child's confidence. You have the key to your child's social acceptance. You be positive.

6. Can they be employed in any profession to become self-reliant?

Answer: Of course. If you notice a little, you will see that your autistic child enjoys a certain job or he is an expert in a particular job. Some like to tidy the house, some like to sing very well, some like to play good musical instruments, some like to help with your cooking, some like to keep track of money with dad. There are many more such examples. Specialized schools provide various trainings to help autistic children become self-reliant. Such as photocopying, printing, mobile servicing, grocery store management etc. Encourage and train your child to do what he likes according to his skills. You, your family, and your child's teacher — all of you, identify the potential.

7. Do they have any special talent or not?

Answer: Of course it is! These are called God Gifted Skills. There are hundreds of talented autistic children. Our job is to identify them and nurture their talents.

8. What are the special therapies for them?

Answer: There are different therapies for autistic children, such as autistic children who have language problems. Therefore, they need to be given speech-language therapy to develop their language structure. Some people have sensory problems. That is why they have to give sensory

integration therapy. Occupational therapy is needed for fine and gross motor problems. Physiotherapy is required to develop physical disability. Specially trained nutritionists for autistic children will need advice. [24]
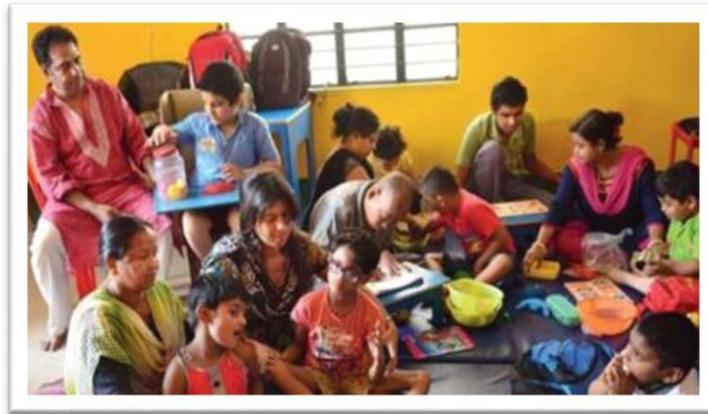
Figure 2.1.1: Autism school In Bangladesh

Here are some things to look out for when caring for children with autism:

- Necessary training of parents
- Participate in joint care of all including teachers, doctors, therapists
- Encourage the child for the desired behavior
- Initially sent to general mainstream schools
- Attempt to teach social customs to the child at home as well as at school
- Participation of children in social events
- Emphasize the child's motivation; practice it (such as drawing, singing, playing sports, etc.)
- If necessary, take the help of specialized schools
- Attempt to improve language skills (speech therapy), teaching sign language if necessary
- Occupational therapy (teaching daily work, vocational work, etc.)
- Psychotherapy, play therapy, sensory integration, etc.
- Give some medicine according to the problem, but it must be according to the advice of a specialist

To diagnose and treat the symptoms of autism, expert advice must be taken. Misconceptions and the tendency to deny the subject must be avoided. People with autism will be able to receive more quality training and qualify by applying the latest technology. A child with autism needs to be given proper care and services without fear of autism. This will enable children and individuals with autism to contribute to society according to their abilities. [23]

Figure 2.1.2: Autistic children in a drawing class.

After learning so much in the field, we have decided to come up with the idea of developing a new system using artificial intelligence to make life easier for children with disabilities. First, we need to know how artificial intelligence helps us in our daily lives.

2.1.3 Artificial intelligence:

Artificial intelligence is a branch of computer science that seeks to mimic human intelligence and thinking power by computers. Artificial intelligence has now become a field of academic learning where teaching is how to create computers and software that will demonstrate intelligence. Japanese robot Asimov Artificial intelligence is the process of manipulating human intelligence and thinking power through technology. [25] The computer is brought into the mimic's magnetic unit so that the computer can think like a human. Such as learning and problem solving. Artificial Intelligence (AI) is the intelligence displayed by a machine. In the field of computer science, the field of AI research defines itself as the study of "intelligent agents": any device that can perceive its environment and take certain steps that go far beyond its success in achieving certain goals. The term "artificial intelligence" is applied when a machine performs "cognitive" functions that are similar to other people's minds, such as "learning" and "problem solving". Andreas Kaplan and Michael Henlin define artificial intelligence as "the ability to accurately interpret information outside of a system, to learn from such information and to focus on flexible adaptations using that learning." [54]Intelligence needs to be removed from definition for mental convenience as machines become increasingly capable. For example, when optical character recognition is no

longer perceived as an example of "artificial intelligence", it becomes a routine technology. The capabilities currently classified include being able to successfully understand human speech, strategic game systems (such as chess and go) to participate in high-level competitions, automated driving, military simulations, and interpreting complex data. AI research can be divided into a number of sub-disciplines that focus on specific problems, perspectives, use of specialized tools, or satisfaction of specific applications.

2.2 Research Summery

Autistic children are considered a burden on society. Thinking autistic children are a curse of God. An autistic child has to deal with all kinds of problems in a family. So various government and non-government organizations are constantly trying to improve the quality of life of these autistic children and continue to try to develop new systems or devices using new technologies. Since now the 21st century and the current era is the era of artificial intelligence. Therefore, we have considered the overall aspects of autistic children and done detailed research about them. After researching their family problems, personal problems, needs, likes, and dislikes, we have come up with a device that can be a great help not only in the life of an autistic child but also in their family life. Because an autistic child needs a person for round-the-clock monitoring. But people have a limit of patience so it is always difficult for a person to handle an autistic child so in addition to human monitoring if a device monitors the autistic child all the time and analyzes their behavior, needs and overall issues then it is for the autistic child and family. Will be very helpful. So we are thinking of a device that would be a wheelchair. It can be paralysis or walk and at the same time, it will be quite beneficial for children who are mentally handicapped. Because the wheelchair will be theoretically using fully automated technology and artificial intelligence. And this artificial intelligence wheelchair will monitor an autistic child all the time, analyze their anger, desires, needs, and send a warning to the parent of the autistic child if a dangerous environment is created.

2.3 Challenges

There are more than 60,000 primary schools in Bangladesh. How many of these teachers have an idea about nervous disorders? If not, then children who come to school as a learning disability,

dyslexia or visual-learner will not be able to continue their studies like other children or will drop out of school despite having special talents. It should also be noted that the primary education system should include such matters as appropriate subjects, education and teacher standards, and teaching materials. In addition to general education, the autistic child needs various therapies; it should be included not only in special schools, but also in mainstream schools.

Pre-vocational and vocational curricula need to be created to prepare them for real life along with biblical education. Then comes the issue of a unified workplace. All of this needs to be taken into account in order to achieve the Autism Goal 2030, and some more accurate, planned and timely steps need to be taken now. [52]

When we first started, we had to work in the field, which was very challenging for us, especially for the first autistic children to go to school and get details about them and their problems, advantages and disadvantages and more details from the doctors. The school is a special school so it was a big challenge for us to go to those schools, even though we had forwarding letters, they did not give us permission to visit all the schools. It was quite challenging us to identify their problems and find solutions without observing the children, yet we learned the details about the problems of autistic children, their standard of living, their desires, likes, dislikes, and based on that we designed an algorithm. Had to.
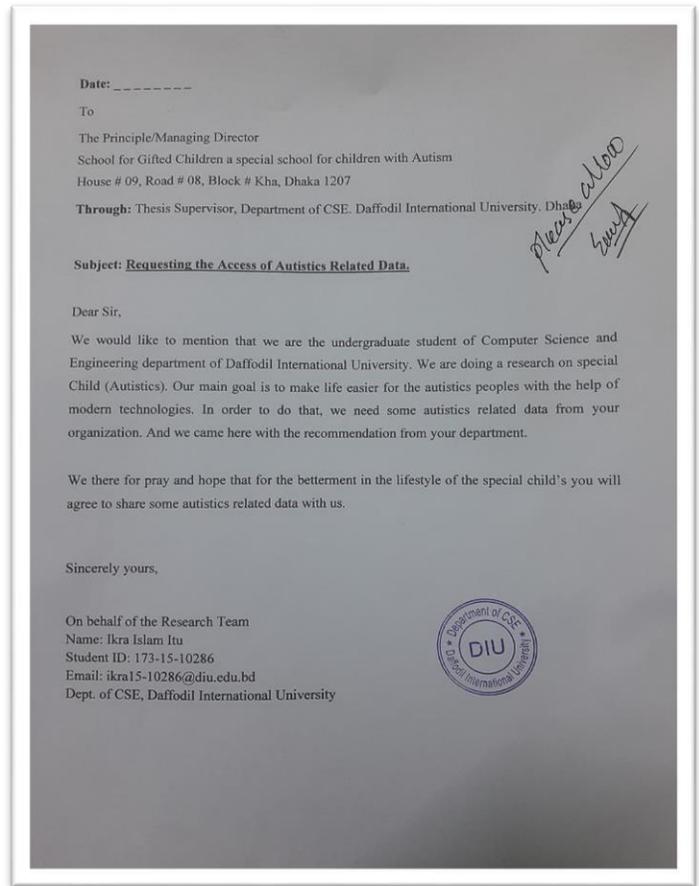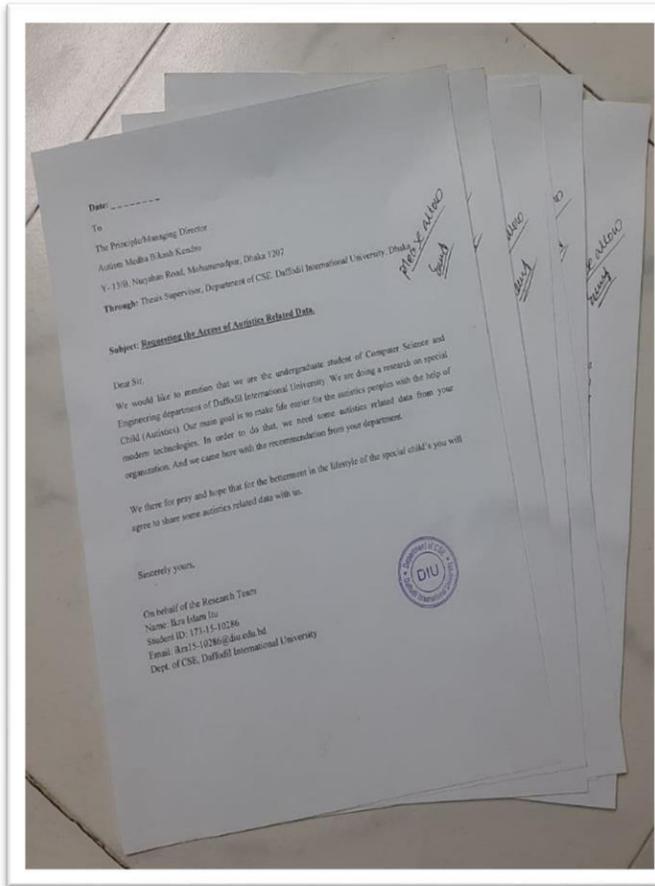
Figure 2.1.3: Forwarding letter for visiting autistic school.

Figure 2.1.4: Normal Wheelchair for those autistic children who cannot walk.

2.4 Resource

2.4.1 Image Processing

First of all, we have to know what is Image,

Image: What is an image? We all know. The name of the image is the image and the name of the image is the image, isn't it? No? However, what we are going through is image processing, in which case the definition of image is a bit different.

Suppose you took a picture using an old-fashioned analog camera. However, no, there will be no image processing in this image. In other words, in short, we call this thing 'image processing', but in fact, it is called 'digital image processing'. Therefore, you understand that the image you need to process the image must be a digital image. That means images taken with a digital camera.

Now the difference between the image of a digital camera and an analog camera is that a digital camera uses an electronic sensor to take a picture and express it in binary format (with these two digits, 0.1). In addition, the thing that is being photographed in the analog camera is taken out by putting the reflection of the mirror inside the camera in the film.

Overall, we need digital images for the image processing we are discussing here. It should be noted that it is also possible to process analog images or optical images.

Image processing:

Image processing actually refers to a digital image (or frame of a digital video. Many frames or pictures are made of video but the video is made) by performing various mathematical operations to bring out the various features, qualities of that image or frame and use them as desired. Trying to gain any results.

Let me give you a simple example to make it easier. Suppose, we will identify two types of images to the machine (machine here is computer). One type of image is an MRI of the brain of a healthy person and another type of image is an MRI of the brain of a person with a tumor in the brain. This identification work or image enhancement, segmentation, detection etc. is image processing. There are a few more steps.

Pixels and resolution:

Everyone is more or less familiar with these two terms. Even then, sometimes it takes a little trouble to separate them. Suppose a number of small dots of different colors represents an image. Now these different color dots are pixels. Many times, we see that the resolution of this image is auto.

In fact, it means that if the image is represented by a frame of reference, how many pixels are there in each axis. Now this calculation will be different for 2D and 3D images. In image processing us usually, work with 2D images in most cases. I would like to give a very simple example to simply explain the resolution.

Suppose your computer monitor has a resolution of 1366×768 pixels. Now if you imagine the whole monitor of your computer as a picture, you will understand that the monitor has 1366 pixels in length and 768 pixels in width. With these pixels of length, width, he is showing you the picture as per your instructions. Mathematically, resolution is a matrix consisting of pixels. When it comes to pixels, I cannot resist the temptation to introduce another term (it is not related to image processing) that is PPI (Pixel per Inch). Work from the name. As the name implies, PPI means how many pixels there are per square inch. Interestingly, if the value of this PPI is above 333 on a screen, your eyes will not feel any pixels or any point inside the screen and if the value of PPI is less than 300, you can see the pixels of the screen with the naked eye. For this reason, you will notice that expensive phones nowadays have a minimum screen of 400 PPI and this makes it look different to see pictures or videos on that screen.

2.4.2 Machine learning

Figure 2.4.1: Mints-handwritten-digits

Something has to be learned to be intelligent. Being able to learn a program on your own is machine learning. It could be a robot or any software. In a normal computer program, we tell the logic of what will work after which, the program works accordingly. However, machine-learning programs are a little different. These automatically understand what to do when. Here the programs are first trained with some data. At first, they do not give the correct output. Learning to learn gives the one-time accurate output.

In machine learning, a machine is a computational engine that has a specific architecture or structure and a number of parameters. This computational engine is commonly known as the model. To solve each type of problem, one has to choose a structured model and the value of the parameters determines the accuracy of that model. Therefore, the biggest challenge in machine learning is to sort the model structure according to our problem and determine the value of the model parameters.

To determine the value of the model parameters we need several sample input-outputs, commonly known as datasets. The task of determining the value of model parameters using datasets is known as model training. As people learn from experience and mistakes, the story of training or teaching a model is almost the same. Works like experience for the dataset model. The larger the dataset, the better the model can be trained. A trained model is used as a process in the next step. In machine learning, the programmer does not have to tell any obvious algorithm. Instead, one has to select a structure of the model and train the model with a dataset that acts as a process.

We have used such programs regularly. As I think of Facebook, you do not see everyone's posts in your news feed. The Facebook algorithm shows you the news according to your choice. By analyzing what you do not like, Facebook slowly understands what you need to show. This is an example. We have many machine learning programs on our smartphones. Siri, Cortana, OK Google, search by voice, photo app, etc. are all machine-learning applications.

Types of Machine Learning:

Machine learning is actually some algorithm. Machine learning algorithms can generally be divided into four parts.

- Supervised learning
- Unsupervised learning
- Semi-Supervised learning
- Reinforcement learning

Supervised Learning:

In supervised learning, the program understands what to do from these examples or training data. First, the program is trained with some training data. This training data contains the output of the input. Once trained, the program automatically understands what it should do. A small example can be given. Giving one input will give output 1. Two inputs will give output 4; three inputs will give output 9. In this way, after analyzing the training data, if you understand the program and input any number, you have to give the output of the square of that number. Then whenever we give a number, the program will give us the square output of that number. Teaching a computer program in this way is supervised learning. **Unsupervised learning:**

What will be the output of training data in Unsupervised Learning is not stated. If given input, the program automatically understands what to do. For example, if we input the data of many people, then the program will find similarity in the information and put similar people together. Divide into different classes or clusters. This is an example of unsupervised learning.
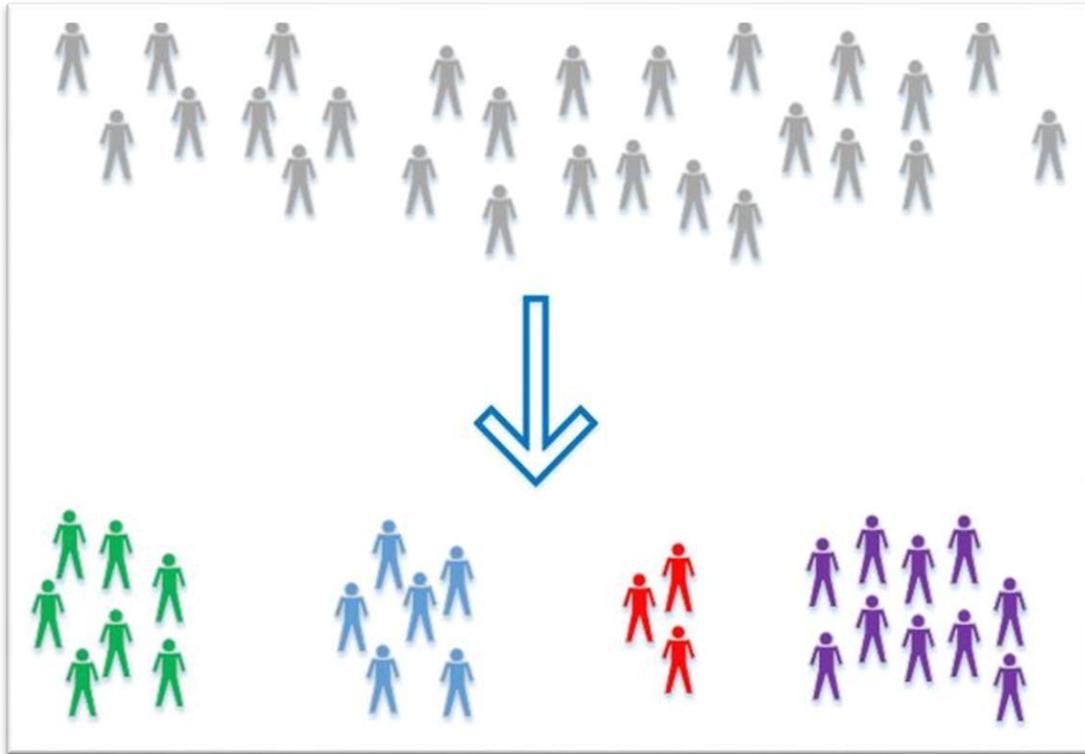
Figure 2.4.2: Unsupervised learning example

Reinforcement learning:

How do we learn in childhood? If I feel good after doing something, I do it more. If something hurts me again, I do not do it anymore. In fact, the way a person or an animal learns is exactly the way it is trained in a program in reinforcement learning.

2.4.3 Neural network:

The Artificial Neural Network branch originated from an attempt to mimic the way the human brain works. Nodes are like human neurons. Any data in the nodes are actually operated there and passed to the next node. The nodes are connected to each other, these are called links. Each link has a weight. In addition, every time you learn, this weight changes. Any type of meshing learning algorithm such as supervised learning, unsupervised learning, reinforcement learning, etc. can be

applied using neural networks. Our brain is a network of many neurons. The neurons in the human brain have four parts. They are Dendrites, Soma, Axon and Synapses.

1. Dendrites receive signals (inputs) from different sources.

2. Soma (cell body) processes those inputs.

3. The Axon process converts the input to output.

4. Through synapses.

Other neurons are connected to Dendrites and can activate other neurons as well. The Artificial Neural Network Concept is based on the structure of our brain. Just as countless neurons in our brains exchange information with each other, so do the neurons in artificial neural networks. However, the neurons (or nodes) of ANN are layer by layer.

A network has three layers:

1-Input Layer - The input data will be here and will be passed to the Hidden Layer.

2-Hidden Layer - The number of hidden layers can be one or more. This layer will have some computation and the result will go to the next hidden layer or output layer (if it is the last hidden layer). If the number of hidden layers is high, the network can be called a deep neural network.

**3-Output Layer -** This layer contains the predicted output.
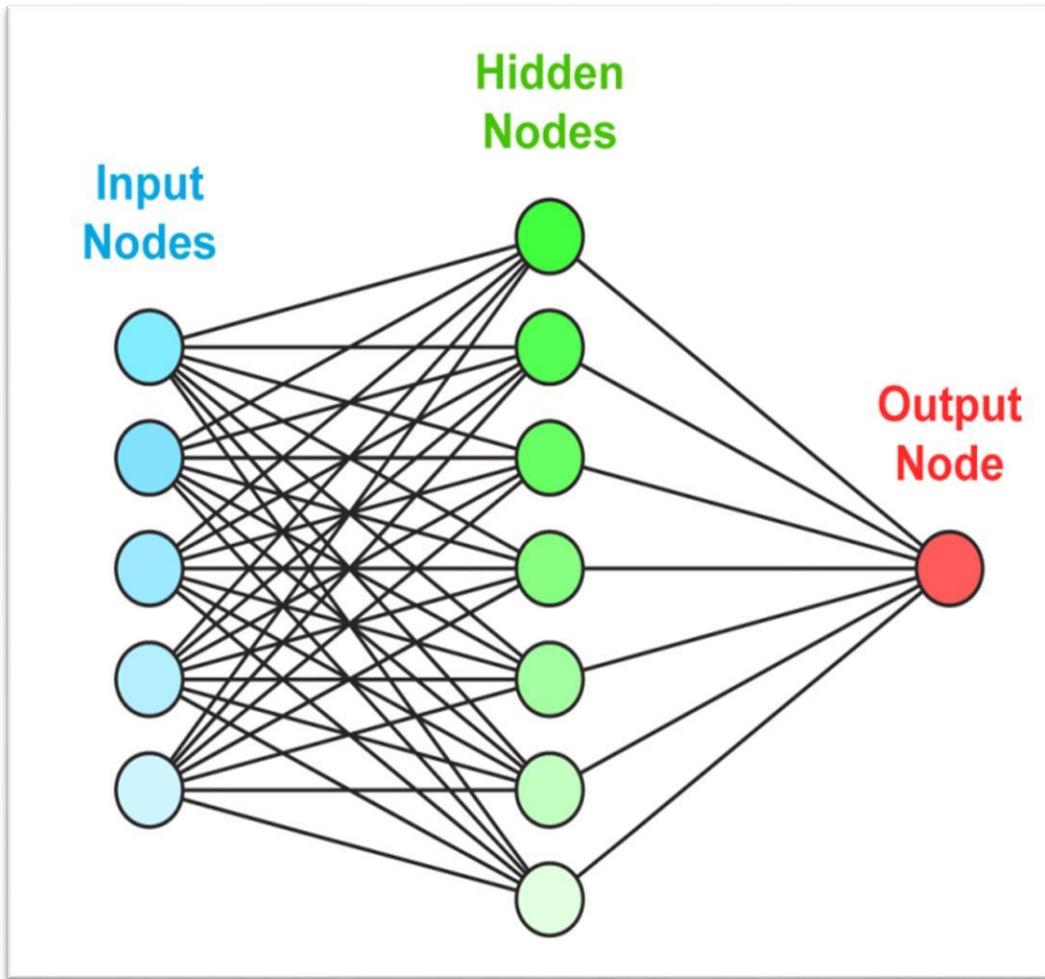
Figure 2.4.3: Neural network Example.

2.4.4 Deep learning:

The deep learning technique works by creating artificial neural networks. The neural network (discussed later the neural network) is the base of deep learning. Images, text, and even sound can be given as input. However, using this method to get better accuracy requires a lot more data. The multi-layer neural network is deep learning or deep neural network learning. Normal neural networks have an input layer, a hidden layer, and an output layer. Deep learning has more than one hidden layer. That is why it is called Deep Learning. Work on deep learning and neural networks has been going on for a long time. However, never before has it been so popular or used so much by people. Now day Deep Learning is a hot topic. Computational power was the reason why it was

not easy to work with deep learning before. Our CPU processes any data linearly. There is a lot of computing to be done in deep learning. In addition, it took a lot more time to work with deep learning. The GPU can process data-parallel. The use of deep learning is increasing day by day due to the rapid results in machine learning using deep learning using the power of GPU. The use of deep learning is so much that now many people understand deep learning by machine
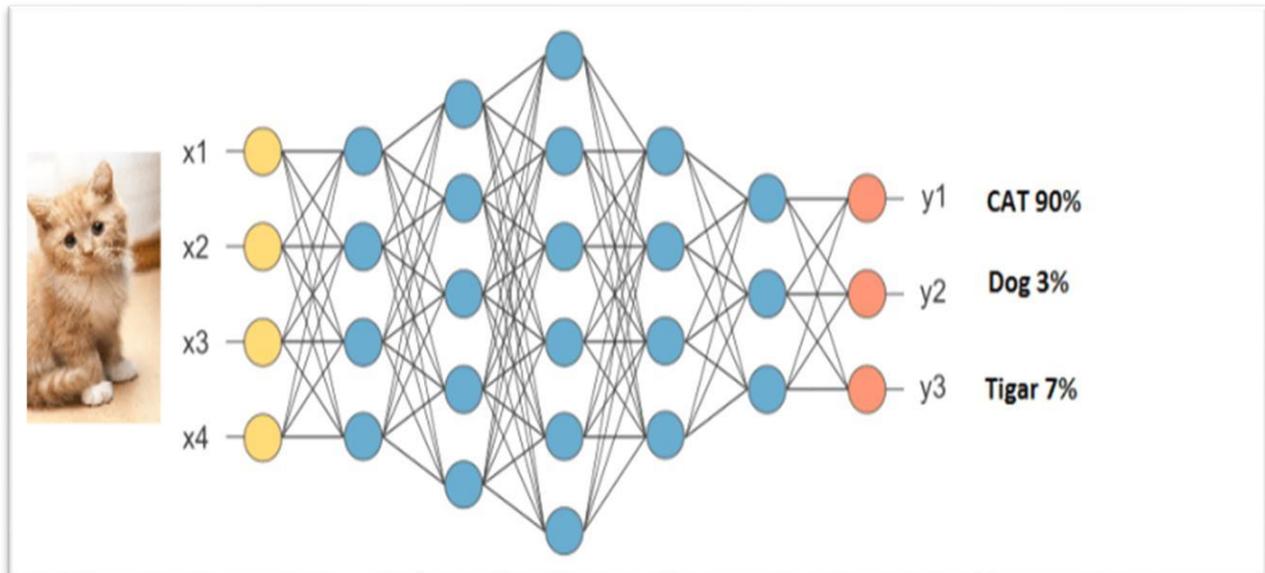

Figure 2.4.4: Deep learning Example.

2.5 The reason we have to use all of those AI resources

As far as we know about the work of artificial intelligence, we have to use our image processing technology in the new method we have come up with.

2.5.1 Reasons to use image-processing technology:

We already know how image processing works; we need image processing technology for this research paper because we want to get alerts about the behavior of autistic children and their needs and desires by monitoring them. Using Deep Learning, you need to break down the image data into different parts, set up the data set using Deep Learning, what kind of moment is being used and what is in demand and then use that data set when an autistic child has face recognition. We will show the desired output by matching the movement of the baby's face with the picture. In

addition, using this data set we can monitor an autistic child all the time by identifying when he needs food, when he has toilet pressure, when he is angry or when he is in a good mood.

Figure 2.4.5: Mood of an autistic Child.

We need many data to use image-processing technology. This requires images of about 100 autistic children per minute per week. Because to understand what changes their facial movement at any time. For example, when an autistic child is hungry, his facial expression will not be as normal as it used to be, or when an autistic child will have toilet pressure, his facial expression will not be as normal. So we need data on facial expressions at all times so that using image processing technology will set the image dataset of children's facial expressions at all times. And a scanner sensor will be used to observe the baby all the time and monitor his facial expressions. This allows facial expressions for autistic children to be recognized, and we get our desired output.

2.5.2 Need to use machine learning because:

From the name but we can get an idea about this technology, although the description of machine learning has been given above. This is why we need to use machine-learning technology to create

this system or robotic device. Machine learning, as the name suggests, will learn the machine. While all systems have some by-default programs, we also have some by-default programs in this artificial intelligence technology. At the same time, we will use machine-learning technology to teach the machine, because the mood or movement of an autistic child can have many changes in behavior. Each child's problem may be different. However, since it is not possible to develop a separate system for each child, machine-learning technology will be used in the system so that the machine itself can learn from each child its behavior and everything and provide such output.

There are four types of machine learning technology.

- Supervised learning
- Unsupervised learning
- Semi-Supervised learning
- Reinforcement learning

Yes, and each type of input and output exchange is different, we will use four steps in our system. So that the system can be built in a perfect way.

Supervised Learning Work like:

In supervised learning, the program understands what to do from these examples or training data. First, the program is trained with some training data. This training data contains the output of the input. Once trained, the program automatically understands what it should do. A small example can be given. Giving one input will give output 1. Two inputs will give output 4; three inputs will give output 9. In this way, after analyzing the training data, if you understand the program and input any number, you have to give the output of the square of that number. Then whenever we give a number, the program will give us the square output of that number. Teaching a computer program in this way is supervised learning. Therefore, for this reason we need to use supervised learning in this system for better performance.

Unsupervised learning:

What will be the output of training data in Unsupervised Learning is not stated. If given input, the program automatically understands what to do. For example, if we input the data of many people, then the program will find similarities in the information and put similar people together. Divide into different classes or clusters. This is an example of unsupervised learning. For the classification system, we have to use unsupervised learning in this system.

2.5.3 Neural networks

An ideal neural network can contain thousands to millions of artificial neurons, called units. These units are arranged in sequence with each other and each is connected to each other just like any other network. There are some units that receive different types of information, such as we see an object, try to recognize the color, understand the drawing, etc. unit these units are called input units. These units help to recognize, know, or process neural networks. On the other side of the network is the output unit —, which reveals exactly what knowledge the computer gained from the busy thing. Last but not least, there is a hidden unit between this input unit and the output unit, which is made up of most of the artificial neurons in the network. So it turned out that it has three types of units, their group is called a layer. The units of each layer are interconnected with each unit and provide the latest result or output only after processing the information from each other. A number denotes the connection of each unit with each other — it is called weight. If one unit agrees with the information of another unit, the weight is positive and if the consent is denied, the weight is negative.

2.5.4 Human learning

Now let us talk about how it works, two ways any data flow in a neural network. A kind of data flows when the computer learns about something and after learning, a kind of data flows when the computer goes into action. When a computer is learning, it needs repeated feedback to correct its learning, whether it is learning right or wrong. For example, if you misspell something in front of the teacher, he corrects it, and we always need feedback to learn something. Suppose you are shooting a balloon with an airgun. You aimed the gun at the balloon and fired, but the bullet went over a surface. Now when you shoot for the second time, be sure to keep in mind the position and

targeting of the previous time. Now you must shoot the gun with a low because your brain knows, he could not put the gun high at the previous time. This way you can create the right target by trying or correcting mistakes.

Neural networks also receive education in this way. Each time it receives data from the input unit. Suppose a photo of a cat is shown to the computer from the input. It stores information such as how it looks, what size it is, where there are eyes, where there is a mouth, and so on. Now not every cat is the same, so it is necessary to show photos of many cats to teach the network. Now if the computer is told by showing another photo, it is a cat or a dog. First, the data input unit will receive it and send it to the hidden unit. The Hidden Unit has a lot of information from previous cat photos, so it will start analyzing the input. Suppose one unit observes the drawing, type, color, etc. of the nose, if it matches the cat, it will give a positive weight, another unit may observe the eye, and another may observe the tail. Therefore, this will provide an output based on the positive or negative result of the Hidden Unit processing and weight. If the output is wrong, the computing system must be informed that it has given the wrong result, and the computing system will not make that mistake again. Just as we learn from mistakes.

Now suppose you taught Neural Network by showing pictures of some chairs and tables. But this time he showed her a picture of a completely new model chair and table, which had never been shown before. This time the computing system will take the idea from the chair tables shown earlier (as people do) and divide the new chair tables into different categories. But what you teach is also important. It will work in tandem with your previous education and you will learn something new every time.

Now someone was told, "Tahmid, look at the chairs and tables in front of you." But no computer can be told in this way, the input of the computer must be in binary — because no matter how much it tries to work like a human, it is not human. As we know, every input of the computer is switched on or off to receive the input (transistor on / off). Neural networks will give you answers only in a negative or positive way. Suppose you input a picture of a table and chair, 1) does it have a place to lean on the back? 2) Does it have a surface? 3) Does it have a soft mattress? 4) Can you sit here comfortably for a long time? 5) Can many things be put on it? Now the computer will answer you "in case of the table", yes, no, yes, yes, no or in binary, the answer will be 10110 and in case of a table, it will not answer, yes, no, no, yes or in binary 01001. This means that while learning, it will see the table as 01001 and the chair as 10110, and it will understand the chair or the table.

Since we are working with autistic children, and have come up with the idea of developing a device to monitor an autistic child all the time, we must use neural networks, because an autistic child constantly changes his behavior and habits, so an autistic child Details information about the child's behavior and everything around him is always required for monitoring. And will be able to automatically input new data systems using neural networks. For this reason, we need to use neural networks for our system.

Figure 2.4.6: Demo model of automated wheel chair

CHAPTER 3 LITERATURE REVIEW

The purpose of our research paper was to research autistic children and come up with ideas to develop a system or device to improve their quality of life using artificial intelligence. For this purpose, we have studied several kinds of literature, read various research papers, and researched research papers. The purpose of the study was to review the literature on the application of AI technology to current assessment instruments for ASD and to determine whether other behavioral features could possibly be used to determine observable identifiers. Has been, and it analyzes, how to differentiate behavioral aspects using artificial intelligence.

With the development of the use of artificial intelligence, its use is also expanding in the field of healthcare. It is relatively easy to give data input using artificial intelligence and at the same time, the accurate output is available. Special technologies or programming of artificial intelligence is

the passive enhancement of features used in diagnostic imaging and genetic medicine image analysis. In addition, the happiest news is that a new practice called radionics has emerged because of the pipeline's valuable decisions and supporting data. According to Formula the main areas of the disease using artificial intelligence technology based on PubMed literature are neoplasms, nerves, cardiovascular, urethra, pregnancy, digestion, respiratory, skin, endocrine, and nutritional issues. In 2013, about 9000 research papers were published in all these fields. However, after the development of research papers on autistic children or in the interest of public health, research has shown that 1 out of 59 newborns has autism. At the same time, 119 studies have been published on this subject. This research could play a good role in the future use of artificial intelligence. Since ML requires big data, data from data collected in all these studies was used. There was a huge imbalance between people with autism and those who did not.

So new research was done to overcome all these limitations. In addition, researchers have worked tirelessly to identify people with and without autism. More than 50 percent of the symptoms in this study have been reduced. In addition, this study may include individuals who do not meet the cutoff threshold but still have some developmental delays. So simple binary may not be suitable for the explanation of the simple output. There is no clear mention in the research about the use of this technology. A number of studies have used similar algorithms. However, before choosing which of these algorithms is the best, it is necessary to select the difference between which one and which one, and what kind of output is available from which algorithm, which one is able to give the correct output.

Each of the research papers we have read had some limitations, and there will be limitations. It is natural that no work can be 100% accurate. However, not only are there limitations to previous research papers, but there are also many barriers to using this system using artificial intelligence in general health care. Although the data set method of machine learning depends on teaching the machine and no research has been done on how to collect data on the data input data quality. No research has been done on data collection, data storage, giving him input in the right way. Despite the great need for information, it has not yet been possible to collect and store accurate information due to the confidentiality and lack of information. So much research has been done so far or the use of artificial intelligence has been perfected based on old information. However, there are still many ways to collect information around the world, and there are many repositories that need to

be researched, and researching them can make a big difference in the future lives of autistic children, accurate data and accurate research and beautiful and far-reaching output. Therefore, we have started research on this subject. After reading over 30 research papers, the ideas we have been presented in this section, and based on these ideas, we will do research on how artificial intelligence can help or change the lives of autistic children in a new way. I hope that we will get a definite result that will give a child with autism a chance to live a little better life.

CHAPTER 4 METHODOLOGY

We all know that today's world is developing by using AI technology. All the sectors of a country are today using Ai technologies for updating the core of the system of a country. As like the education system, Healthcare system, and all the other sectors of a country are using AI technologies. In addition, they are using AI technologies for updating them self and making a better and easier life for the people of a country. So we are going to do something about autistic people, those are not normal people like us. Specifically we are going to make an idea to develop a system or a robot for autistic children. That will help an autistic child to make their life easier. However, it is not always easy to spot signs of autism, especially when the person in question is incredibly bright and/or high functioning. Which implies it can take longer than it should urge a diagnosis—and a late diagnosis means a delay in getting therapies and services that should be available during a child's earliest years. There are several reasons why delays occur. There is no single obvious sign of autism, and some signs of autism can even suggest other, unrelated disorders or personality differences. Evaluators are uncertain whether a specific behavior could be a component of an

autistic pattern or just a personal idiosyncrasy, and many evaluators and fogeys are unwilling to pin a label on a toddler until they are certain the label is correct. In keeping with the publication Spectrum News, a kind of AI called "deep learning" is sometimes better able than mortals to spot relevant patterns. Deep learning might be a spread of machine learning that is actually supported by artificial neural networks, and these styles of programs are honest due to provide evaluators with confirmation of a diagnosis or suggest the need for further evaluation.

However, as the purpose of research, we had to read and do fieldwork, where we can see already there, had some system, robot, apps developed by other people who also think about those special children. In the discussion section, we learned the details of the use of various types of artificial intelligence, which have been invented to make the lives of children with disabilities a little easier. However, none of the devices, apps, or systems I learned about were skeptical, and none of them showed the desired output using artificial intelligence properly. Many more features needed to be added to each system or device, so that their use could really bring a little cheaper in the lives of autistic children. Since these systems or devices are not perfect, we have come up with the idea of developing a system or devices by merging up each system or devices by researching well about these devices or systems. Nevertheless, as we know no system is accurate, and for this reason, we saw that there is some problem with other systems, robots, or apps. Then we have studied those systems for finding the system's problem. In addition, we were thinking about how to solve the problem, and how to create a better solution or system for the special child. Then we made an idea to create a robot that can merge other systems, apps, and Robots using AI. We will use artificial intelligence to develop our system, which we describe in the background section above, but also briefly describe here.

We have different sections of artificial intelligence, e.g.
I came up with the idea of making a wheelchair and a little moving stick using image processing, machine learning, neural networks, deep learning, etc. . Man's patience is low, but machine's patience is infinite, man is annoyed to do one thing over and over again, but one machine can do one job hundreds of times. Never bother. So a child with a disability needs a machine for constant monitoring that will never be bothered because an autistic child is very different from a normal child, the behavior of a disabled child is very different from the behavior of a normal child. So such a machine is needed. Will be customized. Its main function will be to monitor an autistic child

all the time, to identify the advantages, disadvantages, needs, desires of the child by recognizing the face of an autistic child. And by identifying the parent of the autistic child, when the child is hungry, when his toilet pressure comes or when he is angry, what is his state of mind, and when a dangerous environment is created, it will also send information or notification to the parent of the child. The child will be monitored all the time. This wheelchair will have a monitor, through which the child will be taught new things. In this way, the life of an autistic child can be made easier. And the moving stand is for autistic children who can walk but for those with intellectual disabilities, it will also monitor an autistic child like a wheelchair all the time. It will use a sensor so that the child can go to the moving stand wherever he goes and monitors the child all the time, and also send notifications to his parents if any dangerous environment is created. This is how we think it is possible to improve the quality of life of an autistic child by using artificial intelligence.
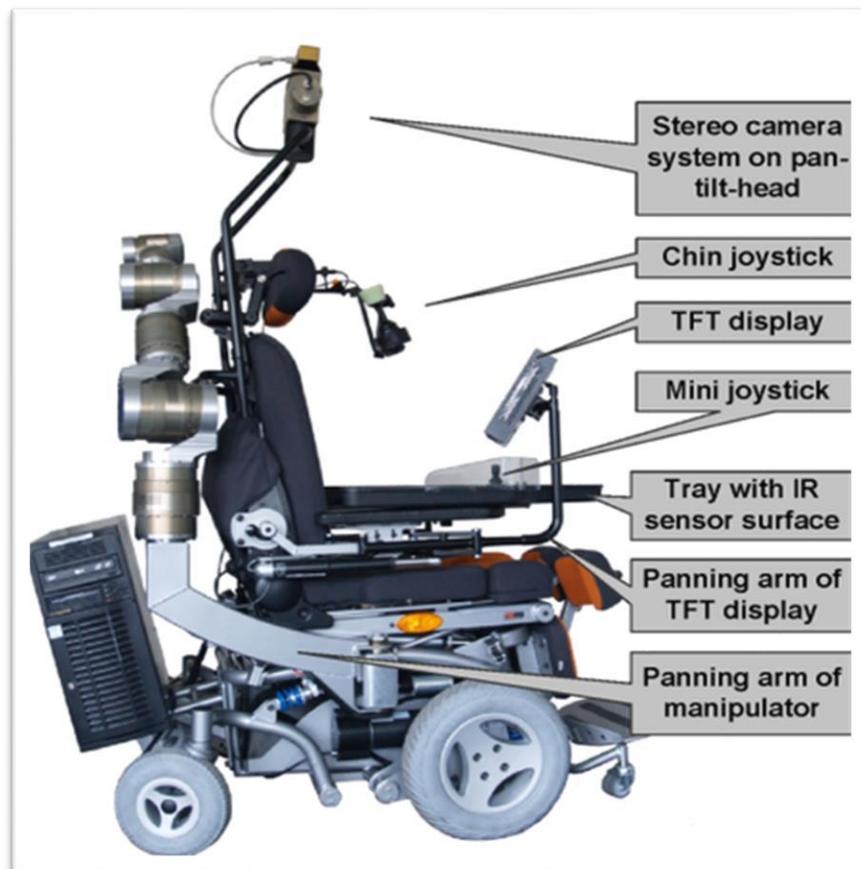

Figure: 4.1: Automated wheel chair.

Figure: 4.1.1: Automated moving Stand.

CHPATER 5 DISCUSSION

When most people hear the word artificial intelligence, they usually think of robots. This is because big-budget movies and novels weave stories about human-like machines that wreak havoc on the world. But nothing can be further from the truth. Artificial intelligence is based on the principle that human intelligence can be defined in such a way that any machine can easily mimic it and perform tasks, from the most common to the most complex. These include learning, reasoning and perception. As technology advances, the previous criteria for defining artificial intelligence become obsolete. For example, machines that calculate basic functions by recognizing optical character or recognizing text are no longer considered artificial intelligence, as this function is now accepted as an underlying computer function. AI is constantly evolving to benefit various industries. Instruments are wired using cross-disciplinary methods based on mathematics, computer science, linguistics, psychology and much more.

5.1 Applications of Artificial Intelligence:

Applications for artificial intelligence are endless. The technology can be applied in many different sectors and industries. AI is being tested and used surgically in the healthcare industry for various medications and in the treatment of patients and in the operating room. Other examples of artificial intelligence machines include computers that drive chess and self-driving cars. Each of these machines must consider the consequences of any action they take, as each action will

affect the end result. In chess, the end result is winning the game. For self-driving cars, the computer system must account for all external data and calculate it to work in a way that prevents collisions. Artificial intelligence also has applications in the financial industry, where it is used to detect banking and finance activities and use flags. Such as the use of unusual debit cards and large account deposits which all help a bank's fraud department. Applications for AI are being used to help streamline and facilitate trade. This is done through pricing through the supply, demand and pricing of securities.

Artificial intelligence refers to the simulation of human intelligence in machines. The goals of artificial intelligence include learning, reasoning and perception. AI is being used in various industries, including finance and healthcare. In works like.
Powerful artificial intelligence systems are systems that perform tasks that are considered humanlike. They tend to be more complex and complex systems. They are programmed to manage situations where no individual intervention is needed to solve problems. These types of systems are found in applications or in hospital operating rooms.

Since its inception, artificial intelligence has come under scrutiny from scientists and the general public. A common theme is the idea that machines will become so advanced that humans will not be able to hold them and they will redesign themselves at engraved rates. Another is that machines can hack into people's privacy and even use weapons. Other arguments argue about the principle of artificial intelligence and that intelligent systems like robots should be treated with the same rights as humans. Self-driving cars have been widely debated because their machines Designed for potential risks and minimal casualties. Presented with a scene of a collision with one person or another at the same time, these vehicles will calculate the option that can cause the least damage.

Another contentious issue many people have with artificial intelligence is how it may affect human employment. With many industries looking to automate certain jobs through the use of intelligent machinery, there is a concern that people would be pushed out of the workforce. Self-driving cars may remove the need for taxis and car-share programs, while manufacturers may easily replace human labor with machines, making people's skills more obsolete.

Recognizing the symptoms of autism is not always easy, especially when the person in question is incredibly bright and / or highly effective. Which means it can take as long as it takes to diagnose

the disease - and late diagnosis means delays in receiving treatment and services that should be available to the child in the early stages. There are a number of reasons for the delay. There is no single obvious symptom of autism and some of the symptoms of autism may even suggest other, unrelated disorders or personality differences. No one is willing to pin a label on a child until they are absolutely certain that the label is correct. According to Spectrum News, a type of AI known as "deep learning" is generally better able than animals to detect relevant patterns. Thank you very much for providing the assessor with the confirmation of the diagnosis of these variants of programs and advising on the need for further assessment Doing.

5.2 Devices that are in the market:

1. Behavior Imaging:

Behavior Imaging, a Boise, Idaho company, uses a system called the Naturalistic Observation Diagnostic Assessment. This tool is an app that permits parents to upload videos of their children for observation. Initially, clinicians watched the videos to form a foreign diagnosis; more recently, however, the corporate has started training AI-like algorithms to watch and categorize behaviors. The algorithms would not diagnose the youngsters but might point clinicians to specific behaviors that may otherwise are missed.

2. Cognoa:

Another use of AI-aided diagnosis is an autism-screening tool created by Cognoa in town California. This tool could be a mobile app that oldsters can use without the involvement of a trained evaluator; it reviews answers to multiple-choice questions still as videos of the kid. So far, while there is interest in and a few use of AI as a tool for supporting diagnosis, there is little support for the notion that AI alone can provide a reliable diagnosis of autism.

3. Robots to Treat Autism

People with autism are often overwhelmed by the demands of human interaction. Social expectations, sensory challenges, difficulty with expressive and receptive speech, and attentional issues can all interfere with optimal outcomes. To circumvent this problem, a number of innovative

groups have started exploring ways to use AI to teach and engage people on the spectrum. One of the most intriguing (and expensive) approaches to using AI in therapy involves creating and training robots to interact with autistic children. Their purpose is to give autistic children practice with identifying facial expressions, interacting socially, and responding appropriately to social cues.

4. Softbank Robotics

Softbank Robotics NAO humanoid robots are about two feet tall and appearance like sciencefiction-style androids. They are capable of expressing emotions by changing the color of their eyes, moving their arms, and changing the tone of their voice. Children with autism often respond more positively to NAO that ***n to a person's therapist, perhaps because NAO (and other robots for autistic children) have unlimited patience and are ready to repeat the identical cues within the same way repeatedly without variation. Many children on the spectrum forestall to their time with and, in some cases, show NAO affection with hugs

5. Massachusetts Institute of Technology

Researchers at MIT, eager to take the interactive robot a step further, required a robot to integrate information about individual children using data from video, audio, and measurements of vital sign and skin sweat. Using this information, together with information about expected and appropriate behaviors, the robot can add up of and answer a child's behaviors.

6. Manatee

Manatee, a Denver startup specializing in AI apps for people with autism, is functioning with a corporation called Robauto to develop a robot called BiBli, which may talk children through challenging interactions without judgment—at the child's own pace. Manatee co-founder and CEO Damayanti Dipayana recognizes both the advantages and limitations of technology like BiBli: "I don't think AI can provide all kinds of therapy, but it's scalable thanks to provide take care of kids who wouldn't get care," she tells all right. "And it's rather more accessible emotionally, too. Many kids with autism or disorder find it easier to speak with the screen or the robot. Within the longer term, the knowledge collected by a robot or app is additionally analyzed and shared with a therapist to produce a therapist with insight into what issues are challenging."

7. AI Apps for Autism

AI-based apps are cheaper and easier to integrate into ordinary homes, schools, and therapists' offices than high-end robots. Many autism apps on the market support behavioral therapy and learning, but most are relatively simple logical tools for following a gaggle of rules and earning points for doing so. "The difference between AI and tech logic is that interaction may start with a daily response on the alternative hand the model starts moving," says Dayana. "The AI app uses a series of exercises to assist the user to cool down or respond appropriately then, betting on the mood of the kid, the model offers exercises then learns how the kid responds. Rather than coding with logic, you provide it a framework within which it can learn; ultimately it starts thinking more quite a soul." The Manatee app is one in every of the primary AI apps offered as an easy, no-cost iPhone download. "The goals are written by clinical psychologists," says Dayana. "It's recommended that children do activities with parents first. There's a step-by-step list that takes it from easy to more advanced skills; the app is meant to be supportive by offering guidance and help with many consider parental involvement."

In the discussion above, we learned the details of the use of various types of artificial intelligence, which have been invented to make the lives of children with disabilities a little easier. But none of the devices, apps, or systems I learned about were skeptical, and none of them showed the desired output using artificial intelligence properly. Many more features needed to be added to each system or device so that their use could really bring a little cheaper in the lives of autistic children. Since these systems or devices are not perfect, we have come up with the idea of developing a system or devices by merging up each system or device by researching well about these devices or systems. This device work as like a robot. By recognizing facial expressions, this device is capable of understanding emotions, hunger, toilet pressure, and informs their guardian. This device also acts like their teacher or therapist, and full-time observer. It observes the person and alerts their guardian for any kind of danger like self-injuring, harmful activity, fire, and any kind of accident. This device will come in two models. One for those autistic children who are not able to walk this model will look like an automated wheelchair, and one for those who are able to walk this model will look similar to a laptop or tab. Both will be fully automated devices.

CHPATER 6 CONCLUSIONS

Without a particular biomarker, ASD screening and diagnosis depend upon behavioral observations. To beat administrator bias during assessments, many have attempted to use AI technology to boost the frequency of accurate detection. During this literature review, we found that studies have attempted to classify items from assessment instruments that are most predictive of the diagnosis to make the tactic less time-consuming. Other studies have experimented with other behavioral characteristics, which can be unique to individuals with ASD to use as markers for classification. However, as research in ASD and AI are both still relatively new, numerous obstacles require being resolved before applying these methods in research or clinical settings. Computer science could play a very crucial role within the future diagnosis of autism. By monitoring autistic children, computer science could identify their problems and perhaps trying to resolve them. Technologies like data virtualization will help decipher data streams of wearables in real-time while also ensuring the protection and privacy of such autism health data.

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