Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and submitted on or before 11.55 PM, Friday 17th January, 2020)

The purpose of this form is to allow final year students of the B.Sc. (Hon) degree program to enlist in the final year project group. Enlisting in a project entails specifying the project title and the details of four members in the group, the internal supervisor (compulsory), external supervisor (may be from the industry) and indicating a brief description of the project. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

PROJECT TITLE (As per the accepted topic assessment form)	Aliza: Smart Mirror as Autistic Education Assistant

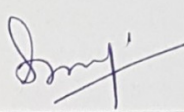| RESEARCH GROUP (as per the Topic assessment Form)	Artificial intelligence and machine learning

PROJECT NUMBER	(will be assigned by the lecture in charge)
	2020-079

PROJECT GROUP MEMBER DETAILS: (Please start with group leader's details)

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	R.S.Najeeb	IT17137560	+94 70 140 3834	IT17137560@my.sliit.lk
2	Uthayan.J	IT17035040	+94 76 862 4842	IT17035040@my.sliit.lk
3	R.P.Lojini	IT17131216	+94 76 122 9267	IT17131216@my.sliit.lk
4	G.Vishaliney	IT17421768	+94 77 802 5475	IT17421768@my.sliit.lk

SUPERVISOR Details

Jesuthasan Alosius		20/1/2020
Name	Signature	Date

CO-SUPERVISOR Details (will be assigned by the Supervisor, if necessary)

Anjalie Wasana Gamage		21/01/2020
Name	Signature	Date

EXTERNAL SUPERVISOR Details (if any, may be from the industry)

-	-	-	-	-
Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER

Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem:

Autism is a neurodevelopmental disorder. Through our research we found out few difficulties that autistic children will face over the lifespan. Such as:

- It significantly affects and alters the areas of communication, social interaction and behavior.
- It is a lifelong disorder and it will drastically limit the life of the person who has it besides causing significant stress in the family.
- While much has been learned about how to educate children with autism spectrum disorder (ASD), it is not fully effective. Children with ASD have a hard time applying what they've learned in one setting such as the therapist's office or school to others, including the home.
- Autism affected child unable to learn like ordinary students. They need some special methods and equipment to improve their learning capacity.
- A research (Who's that in the Mirror? Autism and the Developing Sense of Self) mention that the autistic children did spend a lot more time looking at objects in the mirror, and that their behavior toward their reflections differed. There for we have to find better solution this learning with help of smart mirror technology.
- Autism children unable to concentrate on learning more than 5 to 10 minutes continuously.
- We have to introduce self-learning system to autism child which will make interesting to learn.
- We have to develop a concurrent evaluations system for their self-learning.

Description of the Solution:

Early intervention is the most effective way to speed up child's development and reduce the symptoms of autism at the earliest. We are proposing a smart mirror to treat autism kids which can be more cost effective than already existing AI-robots for autism. Researchers have done a study among autistic, Down syndrome and typically developing children by providing mirror to them. They found that autistic kids spent more time looking at objects in the mirror. A wall-based interactive projection like smart mirror can develop screen engagement skills of the kids. A number of therapies are already there for autism. We have chosen few of them such as Speech therapy, Applied Behavior analysis.

Our idea is to visualize activities through a mirror for autistic children with voice assistant. Using an assistant like Siri and Alexa makes communication very straightforward for autistic child. Many people with autism are visual thinkers so rather than using text instruction a virtual assistant can be most effective. We should also evaluate the child to know how far they have overcome autism. Evaluation can be done by providing them activities. As mentioned in the research problem autism child unable to concentrate for more than 5-10 minutes. Monitoring whether they are being attentive to the activity is more important to make them engaged. Recognizing their facial expressions and switching the visuals and activities can increase their interest drastically. If the child seems to be bored of lesson, then the smart mirror will play their favorite cartoon or music to entertain them.

Hope "Aliza" can be the one among the therapists in special schools in near future. Data sources from them can increase the accuracy and help to enhance it with more features.

Main expected outcomes of the project:

Main Objective:
  To Self-taught system for autistic children in aid for their education

Sub Objective:
  To improve a child verbal skills.
  To improve writing skills.
  To improve ethical behavior through activities.
  To improve focus capacity.

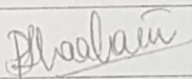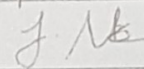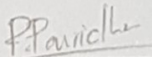## WORKLOAD ALLOCATION (extract from the topic assessment form)
(Please provide a brief description about the workload allocation)

MEMBER 1	R.S.Najeeb(IT17137560

It is difficult to know how they feel or what their current emotion is while educating individuals with ASD.
- Monitor the facial reactions real time.
- Match the facial feature points with the trained model of expressions.
- Create activities and play videos to keep them engaged.
- Create activities to train social ethics.

MEMBER 2	Uthayan.J (IT17035040)

Provide numeric practice and basic mathematic calculation practice for children
- Create exercises for autistic children to identify numeric through animations and pictures.
- Create simple mathematic calculation exercises.
- Evaluate autism children's study levels by Deep Learning.
- Make study level report for autism children

MEMBER 3	R.P.Lojini (IT17131216)

Special need voice assistant to instruct about the activities or greet for their performance.
- Convert voice input to text using speech recognition
- Evaluate their verbal activity or reply back to their queries by analyzing using NLP.
- Convert back to voice along with visuals
- Make study level report for autism children

MEMBER 4	G.Vishaliney (IT17421768)

To show Letters and simple words through animation and pictures on smart mirror so they are encouraging to do their own writing exercises. They are constantly monitored and evaluated during their training by Deep Learning technology.
- Create writing therapy animations and pictures.
- Create writing therapy exercises.
- Evaluate autism children's study levels by Deep Learning.
- Make study level report for autism children

DECLARATION

"We declare that the project would involve material prepared by the Group members and that it would not fully or partially incorporate any material prepared by other persons for a fee or free of charge or that it would include material previously submitted by a candidate for a Degree or Diploma in any other University or Institute of Higher Learning and that, to the best of our knowledge and belief, it would not incorporate any material previously published or written by another person in relation to another project except with prior written approval from the supervisor and/or the coordinator of such project and that such unauthorized reproductions will construe offences punishable under the SLIIT Regulations.

We are aware, that if we are found guilty for the above mentioned offences or any project related plagiarism, the SLIIT has right to suspend the project at any time and or to suspend us from the examination and or from the Institution for minimum period of one year".

	STUDENT NAME	STUDENT NO.	SIGNATURE
1	R.S.Najeeb	IT17137560	
2	Uthayan.J	IT17035040	
3	R.P.Lojini	IT17131216	
4	G.Vishaliney	IT17421768	