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**Education for Dyslexic students using**

**Virtual Reality**

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   1. **Problem Statement**

To provide an educative learning platform for dyslexic students in which the core fundamentals will be taught to the students using virtual representation.

* 1. **Who will use the proposed system**

The children suffering from Dyslexia are going to be the primary users of our system.

* 1. **Benefits**
* The dyslexic students would gain confidence and develop interest in learning
* The understanding of core fundamentals would improve
* Achieve the ability of independent learning

1. **Functional Specifications**
   1. **System Overview**

This system is going to be a web based application wherein a dyslexic student will enter a virtual world. This world is where the student can choose from multiple courses related to core fundamentals, take quizzes and tests. It will also provide a interactive visual learning in the form of 3D object generations as well as human avatar interaction.

* 1. **Scenarios**

Let’s assume that the student selects the course module. After choosing the course module, the different courses such as shapes, colors, etc. will pop up in the virtual scene. When the student selects shape module, then the list of different shapes will be displayed and after selecting a particular shape, the shape will be visually represented to the student along with the shape’s properties such as no. of sides, no. of vertices, area, etc.

Another scenario would be that when a student selects for dynamic object generation functionality, the student will type in a query like “A red ball on a brown table” which will generate the specified objects and the student will get a visual representation of the query.

* 1. **Details of scenarios**

Considering the dynamic object generation module, if the student enters a query which could not be interpreted by our system or if the query entered is blank, the student will get an error message such as “The entered query cannot be processed”. To solve this issue another message that is “Enter another query” with a button will be displayed and if the student clicks the button then the same input box will reappear.

**3. External Interface Specification**

* 1. **User interfaces**

The User Interface will be a virtual environment where the student can have a 360 experience. The student can select from multiple environments which he/she feels comfortable, for example an environment could be a class room, a garden, etc.

* 1. **Hardware interfaces**

The hardware interfaces that will be used are a basic keyboard and a mouse. The keyboard and mouse will be used for basic movement in the virtual environment and for entering queries in the dynamic object generation module.

* 1. **Database**

We would be storing multiple objects in our database. The objects will be annotated according to their attributes like color, size and the object name itself. This database would be stored on a local machine (Server if deployed) and the path to this database would be present in our program.

**4. Technical Specifications**

* 1. **Programming languages**
* UI – A-Frame (WebVR Framework), JavaScript
* Backend – Python, Django Framework
* Database - MySQL
  1. **Versions of different components**
* A-Frame – 0.8.0
* Python – 3.7
* MySQL – 5.7
  1. **IDE to be used**
* PyCharm
  1. **Performance Constraints**

The major constraint is the web browser being compatible to the virtual 3D rendering. As the entire application is aimed for rendering 3D objects, the browser must be able to handle the same.

The next constraint would be the presence of human tutor with the student. The student might not be able to interact with the application by himself/herself and the evaluation and surveillance of the human tutor is a must in this case.

Limited query processing is present in the application as the objects will be only mainstream objects such as day to day objects. The query will not provide an object response if it contains words which are not present in the dictionary of the objects.