# Abstract

The brain is the most important and complex organ of the human body. It controls and coordinates all the actions and reactions that we make. It is being taught in a biology course at both colleges and elementary schools, but it is arduous for students to understand it thoroughly. There are many existing applications available for demonstrating it. However, they fall short in some areas, including performance, information, and design. Thus, we aim to develop a user-friendly 3D application for demonstrating the morphology, taxonomy, physiology, and anatomy of the human brain that will make it easier for students to grasp the concept. In addition, we employ the agile methodology to design and develop our application because it provides faster development with the support of incremental changes. Also, the tools and technology which we will be using are Unity 3D, Android Studio with languages C# and Kotlin, and 3D technology. This application will help the students to envision the concept of the brain with more effective UI/UX design. It will have human-centered interfaces that correspond to the natural abilities of users, save their effort and boost the positive usability of the system.

**Keywords: Human Brain, 3D Application, Unity 3D, C#, Kotlin, Android Studio, UI/UX Design**

# Introduction and Background

The Brain is the most important and complicated organ in the human body. It controls all of our activities, tasks, thoughts, memory, emotions, touch, motor skills, vision, breathing, temperature, hunger, actions, reactions, and everything that regulates our body. Together, the brain and spinal cord that extends from it make up the Central Nervous System, CNS. The Human Brain is studied by considering its four perspectives: Taxonomy, Anatomy, Physiology, and Morphology. In addition, the brain sends and receives chemical and electrical signals throughout the body. Different signals control the different processes and your brain interprets each.

# Problem Statement

It is a fact that students frequently run into difficulties when studying the human brain, especially college students or beginners. It is challenging for them to develop an understanding of the human brain from the perspectives of morphology, anatomy, physiology, and taxonomy. There is also a lack of 2D/3D desktop/mobile applications for understanding the human brain from the aforementioned perspectives. Further, it also demands higher cognitive effort from learners because these systems and applications mostly have poor user experiences and improper information design.

# Solution

By considering the above-mentioned problem, we have chosen the project to develop a 3D mobile application for understanding the human brain. It will specifically focus on the morphology, anatomy, physiology, and taxonomy of the human brain. As a result, learners will find it easier to grasp the concepts of the human brain with our app.

# Project Goals

In order to illustrate the morphology, taxonomy, anatomy, and physiology of the human brain, we plan to create a user-friendly 3D application. Our project's major goal is to design and create an application system with a user-centered interface that will improve usability.

# Literature Review

# Project Rationale

Our project's primary goal is to develop 3D mobile applications. This project is important because we'll be implementing the most recent tools and technologies, which will keep us aware of the IT industries. The users will also profit because they will be able to learn in new and innovative ways as most students in our area still apply outdated textbooks for their education.

# Scope of the Project

It will just focus on the basic introduction of the human brain with the aforementioned perspectives. It will not have the features of visualizing the working of neurons for example.

# Project Methodology

The agile methodology would be used for both design and development. We would specifically adhere to the agile practices of Extreme Programming (XP). It offers various advantages, including faster project development timelines, cost and schedule control, flexibility, and high-quality projects. Additionally, we'll be using Android Studio and Unity 3D to create 3D designs and mobile applications, respectively. Likewise, C# for Unity 3D, kotlin/java, and React Native/Flutter for Android Studio will be required languages for the tools.

# Proposed Solution and Expected Results

Students will understand the concepts of the brain efficiently with the use of this application, which has an effective UI/UX design. They can also master the taxonomy, morphology, physiology, and anatomy of the brain through improved memory design with recognition and recall. Additionally, users can realistically move and rotate the virtual 3D human brain in the app while viewing from different angles and magnifications. Due to the fact that recognition is significantly quicker than recall in memory, it gives users a superior memory design.