IT4020 - Modern Topics in IT

ASSIGNMENT 3

2025

Group 76

Group Members

Name	IT Number
IT21700156	Nanayakkara A.A.R.
IT21220388	Senadheera W.D.N.D.
IT21214066	Perera M.M.P.
IT21576966	Weedagamaarachchi K.S.
IT21289484	K.D.R. Manditha

1) Project Overview

This project involved building a marker-based Augmented Reality (AR) application using Unity and Vuforia Engine, a powerful SDK for mobile AR development. The objective was to create an immersive and interactive experience by rendering 3D models on top of distinct image markers, with each model reflecting a unique object from a selected real-world scenery. We selected a zoo as our common environment. Each group member contributed one high-quality 3D model relevant to this theme, and each model was mapped to a unique image marker. When a marker is detected by the AR camera in the mobile app, the corresponding 3D model appears precisely aligned and scaled above it.

2) Development Process

Platform Used:

Unity - Main development engine
Vuforia - Marker tracking system integrated into Unity
Unity Asset Store - Source for 3D models, animations, and particle effects

Steps: -

[1] Marker Preparation

We used 5 different image markers, each uniquely designed or selected for high contrast and detail. These were uploaded to Vuforia Target Manager, which analyzed and generated a device database. The database was imported into Unity, allowing image tracking at runtime.

[2] Unity Project Setup

A new Unity 3D project was created. The Vuforia Engine was activated via the Unity Package Manager. A Vuforia AR Camera prefab was added to the scene and configured with our license key. The 5 Image Target prefabs were added to the scene; each assigned a different marker from the Vuforia database.

[3] 3D Model Integration

Each group member sourced a GLB 3D model relevant to the chosen theme. Models were imported from Unity Asset Store. The models were imported into Unity and attached as children of their corresponding Image Target Game Objects. We adjusted position, rotation, and scale to ensure natural alignment when rendered over the marker.

[4] Adding Creative Enhancements

Animations were applied using Unity's Animator Controller. Audio sources were attached to models to trigger sounds when visible.

[5] Final Build and Testing

A final APK was generated for Android deployment. A demo video was recorded showing:
-Marker scanning
-3D models appearing
-Creative elements in action (animations, sound)

3) Group Member Contributions

Member Name	Marker Image Description	3D Model Used	Creative Element Added
IT21700156 Nanayakkara A.A.R.	Tiger	Tiger (.glb)	Walking animation
IT21220388 Senadheera W.D.N.D.	Wolf	Dog (.glb)	Walking animation
IT21214066 Perera M.M.P.	Monster	Cat (.glb)	Walking animation
IT21576966 Weedagamaarachchi K.S.	Dragon	Horse (.glb)	Walking animation & Sound
IT21289484 K.D.R. Manditha	Human	Human (.glb)	Walking animation

4) Demonstration (Video & Screenshots)

https://drive.google.com/drive/folders/1XqmDdCO5OJupiySeS-SEzQZC1KxtY5Ys