

**AR APPLICATION FOR
VIRTUALTOUR OF SATHYABAMA**

Submitted in partial fulfillment of the
requirements for the award of
Bachelor of Engineering degree in Information and Technology

By

**Nitheshwer V S (Reg.No - 39120076)
Rithwik E (Reg.No - 39120096)**



**DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by AICTE
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**JEPPIAAR NAGAR, RAJIV GANDHISALAI,
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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of Nitheshwer v.s (Reg.No - 39120076) and Rithwik E(Reg.no - 39120096) who carried out the Project Phase-2 entitled “AR app for virtual tour of sathyabama” under my supervision from January 2023 to May 2022.

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DECLARATION

I, **NITHESHWER V S** (Reg.No- 39120076), hereby declare that the Project Phase-2 Report entitled **AR APPLICATION FOR VIRTUAL TOUR OF SATHYABAMA** done by me under the guidance of **Dr.A.SIVASANGARI, M.E.,Ph.D** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in **INFORMATION TECHNOLOGY**

DATE: 11.5.2023

PLACE: Chennai

Nitheshwer

SIGNATURE OF THE CANDIDATE

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ABSTRACT

Augmented Reality is a breakthrough technology that could cease execution of complex operations. Augmented Reality mixes virtual and actual reality, making available to the user new tools to ensure efficiency in the transfer of knowledge for several processes and in several environments. With massive penetration of mobile phones the tourism industry is adopting augmented technology (AR) and apps supported by smartphones to create and provide a memorable and exciting experience to tourists with fun, interaction and learning. In this paper we first introduce the basic AR technology and then review several typical and well-known AR engines/platforms developed by companies and research institutes, focusing on their technical aspects. The challenges and recent development trends and directions are analysed to provide an insight for future research and development of AR technology for tourism and beyond among the opportunities for colleges and universities to show their environment, facilities and achievement to the visitors or prospective students. Along with the advancement technology of mobile devices, smartphone and tablet have created new possibilities for the institutions to create mobile application which is integrated with augmented reality to engage campus visitors in new and more intuitive ways. Augmented reality can superimpose a virtual object or information into real world environments. Many universities are utilizing this technology as a mobile campus touring application to make the visitors become familiar with the campus through the self-guided devices. This paper presents a survey of mobile campus tour application based augmented reality at various universities as well as the features of each application such as information about points of interest, location search, navigation, 3D campus building, campus events, ecological environment, virtual tour, and outdoor games

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CHAPTER 1

INTRODUCTION

Our college or university normally has several buildings to accommodate the learning activities for thousands of students from various faculties and departments. The large area of campus sometimes make visitors quite easily get lost amid all the buildings. To solve this problem, the university parties usually held a campus tour activity to show their environment, facilities and achievement to the visitors or newcomers who first time come to the campus. Traditionally, a campus tour requires a person who knows well about campus to guide and tell the information to the visitors while walking around the campus. However, it's not always possible for visitors to remember all the information and become familiar with the campus during the one-day tour. Fortunately, the advancement of technology have brought a new way for campus tour by utilizing the augmented reality technology and let the visitors familiarize themselves with the campus via self-guided devices. Augmented Reality (AR) is a field of computer research that aims to supplementing reality by mixing computer generated data and real world environments. AR combine the virtual objects or the information to the real environment through the computer graphics technology which makes the virtual objects appear to originate from the existing environment. In the present day, AR can be used with mobile devices, in conjunction with widespread use and emergence of smartphone and tablet from a decade earlier. Through the prototyping and visualization of products, many universities are providing AR as a campus touring systems, and in this way allowing visitors, new students, or even the prospective students to become familiar with the campus environment. This paper presents a survey of various mobile campus tour application based augmented reality, the implementation, and the features of each

Augmented reality (AR) is the integration of digital information with the user's environment in real time. Unlike virtual reality (VR), which creates a totally artificial environment, AR users experience a real-world environment with generated perceptual information overlaid on top of it. Augmented reality is used to either visually change natural environments in some way to provide information.

to provide additional information to users. The primary benefit of AR is that it manages to blend digital and three-dimensional (3D) components with an individual's perception of the real world. AR has a variety of uses, from helping in decision-making to entertainment. AR delivers visual elements, sound and other sensory information to the user through a device like a smartphone or glasses. This information is overlaid onto the device to create an interwoven experience where digital information alters the user's perception of the real world. The overlaid information can be added to an environment or mask part of the natural environment.

Boeing Computer Services Research employee Thomas Caudell coined the term augmented reality in 1990 to describe how the head-mounted displays that electricians use when assembling complicated wiring harnesses worked. One of the first commercial applications of augmented reality technology was the yellow first down marker that began appearing in televised football games sometime in 1998. Today, Google Glass, smartphone games and heads-up displays (HUDs) in car windshields are the most well-known consumer AR products. But the technology is also used in many industries, including healthcare, public safety, gas and oil, tourism and marketing.

application.(AR) provides people with another alternative way of acquiring knowledge and information. Especially in the post- pandemic period, the immersive experience of AR provides another possibility for people's virtual tours and online exhibitions

CHAPTER 2

LITERATURE REVIEW

Augmented Reality for Fu-Jen University Taiwan,2012,Provides the information about various points of interest (POI) on campus,CAViAR for Khalifa University UAE,2012,a marker based system for indoor localization and indoor navigation,Mobile Campus Touring System for Beijing Normal University, China,2013,Provides the information and activity of various POI on campus,Campus Navigation Based on Mobile AR for Shenyang University of Technology China,2013,Provides the exact position of user and information about various POI on campus,Campus Event App for Bowling Green State University, USA,2014,Find and show the information about nearby events on campus,Lehigh Augmented Campus Tour for Lehigh University, USA,2014,Provides the information about campus buildings,Augmented Reality for ecological campus navigation,Chung Hua University Taiwan,2015,Provides the information about ecological environment on campus,Augmented Reality for University of Quindio Colombia,2016,Provides the information about various POI on campus,AR Game for Discovering Landmarks of Mil.Nueva Granada University Colombia,2016,Provides the information about POI on campus through the mini-games,Augmented Reality for Campus of the Autonomous University of Nayarit Mexico,2016,Provides information on the location of points of interest within the UAN campus,Augmented Reality for Smart Campus Urbanization MSKU Turkey,2017,Provides the information about various POI location on campus,MyARCampus for Patras University Greece,2017,Provides the information about various POI location on campus and provide a easy navigation around the campus,iMAP-CampUS for Macquarie University Australia,2017,Provides the information about various POI on campus and a easy to use app on whole,Semantic Web and Augmented Reality for University of Cuenca Ecuador,2017,Advanced search to find people, events and POI within campus and give a proper marking for the locations

Chapter 3

Software requirements

3.1 UNITY

Unity is a real-time 3D development platform for building 2D and 3D application, like games and simulations, using .NET and the C# programming language. Unity can target 25+ platforms across mobile, desktop, console, TV, VR, AR, and the web. Unity is FREE to start with and is available for both Windows and macOS. Over 50% of games published are made with Unity. Unity has a very active community, and its Asset Store offers a way to buy and sell assets and plug-ins. Visual Studio offers Unity powerful development tools. To get started with AR development, Unity recommends using AR Foundation to create your application for Unity's supported handheld AR and wearable AR devices. AR Foundation allows you to work with augmented reality platforms in a multi-platform way within Unity. This package presents an interface for Unity developers to use, but doesn't implement any AR features on its own. To use AR Foundation on a target device, you also need to download and install separate packages for each of the target platforms officially supported by Unity:

- ARCore XR Plug-in on Android
- ARKit XR Plug-in on iOS
- Magic Leap XR Plug-in on Magic Leap Windows
- XR Plug-in on HoloLens

Downloading, installing, and activating Unity, using the Hub, and how to manage your licenses. An in-depth look at each of the main windows you'll use every day in Unity, including useful shortcuts and hotkeys.

Unity is a great tool for prototyping everything from games, to interactive visualizations. In this article, we run through all you need to know to get started using Unity. First, a little bit about me: I'm a hobbyist unity developer, 3d modeler and graphic designer who's worked with Unity and Blender for over 5 years. I'm now a Financial Maths student at University College Dublin, and occasionally I do freelance graphic design, web prototyping, and game prototyping. Unity is probably the least opinionated of the 3 platforms. It gives you a very raw product out of the box, but is highly flexible, well-documented, and highly extensible to build pretty much any genre of game you can think of. There are plenty of highly successful games such as Escape from Tarkov (FPS), Monument Valley (Puzzler), and This War of Mine (Strategy / Survival) all built in Unity. In reality the engine you build your first game on is probably not critical, so my advice is just to pick one and go with it.

Unity gives users the ability to create games and experiences in both 2D and 3D, and the engine offers a primary scripting API in C# using Mono, for both the Unity editor in the form of plugins, and games themselves, as well as drag and drop functionality. Prior to C# being the primary programming language used for the engine, it previously supported Boo, which was removed with the release of Unity 5, and a Boo-based implementation of JavaScript called UnityScript, which was deprecated in August 2017, after the release of Unity 2017.1, in favor of C#.

Within 2D games, Unity allows importation of sprites and an advanced 2D world renderer. For 3D games, Unity allows specification of texture compression, mipmaps, and resolution settings for each platform that the game engine supports,[50] and provides support for bump mapping, reflection mapping, parallax mapping, screen space ambient occlusion (SSAO), dynamic shadows using shadow maps, render-to-texture and full-screen post-processing effects.

Two separate render pipelines are available, High Definition Render Pipeline (HDRP) and Universal Render Pipeline (URP, previously LWRP), in addition to the legacy built-in pipeline.[52][53] All three render pipelines are incompatible with each other.[54] Unity offers a tool to upgrade shaders using the legacy renderer to URP or HDRP

How to get started making Scenes, GameObjects and Components; reading input; and adding gameplay or interactivity to your Project.

Asset Workflow How to get Assets into Unity from a variety of different sources, including graphics, art and sound from external programs, package files from other developers, and ready-made Assets from our Package Manager and the Asset Store

Editor Features Information about many of the Editor's powerful features, to help you customize your workflow, integrate with external tools, and extend the Editor itself.

Analysis Get performance information about your application with the Unity Profile

Upgrade Guides Important notes for upgrading projects that were authored with older versions of Unity

Unity has custom resources to bring your immersive vision to life. Our industry-leading software development platform pairs tools purpose-built for Augmented Reality creators and a unified workflow across devices that lets you focus on pushing the boundaries of your imagination

AR Foundation lets you take currently unavailable features with you when you switch between AR platforms. If a feature is enabled on one platform but not another, we put hooks in so that it's ready to go later. When the feature is enabled on the new platform, you can easily integrate it by updating your packages rather than having to completely rebuild your app from scratch.

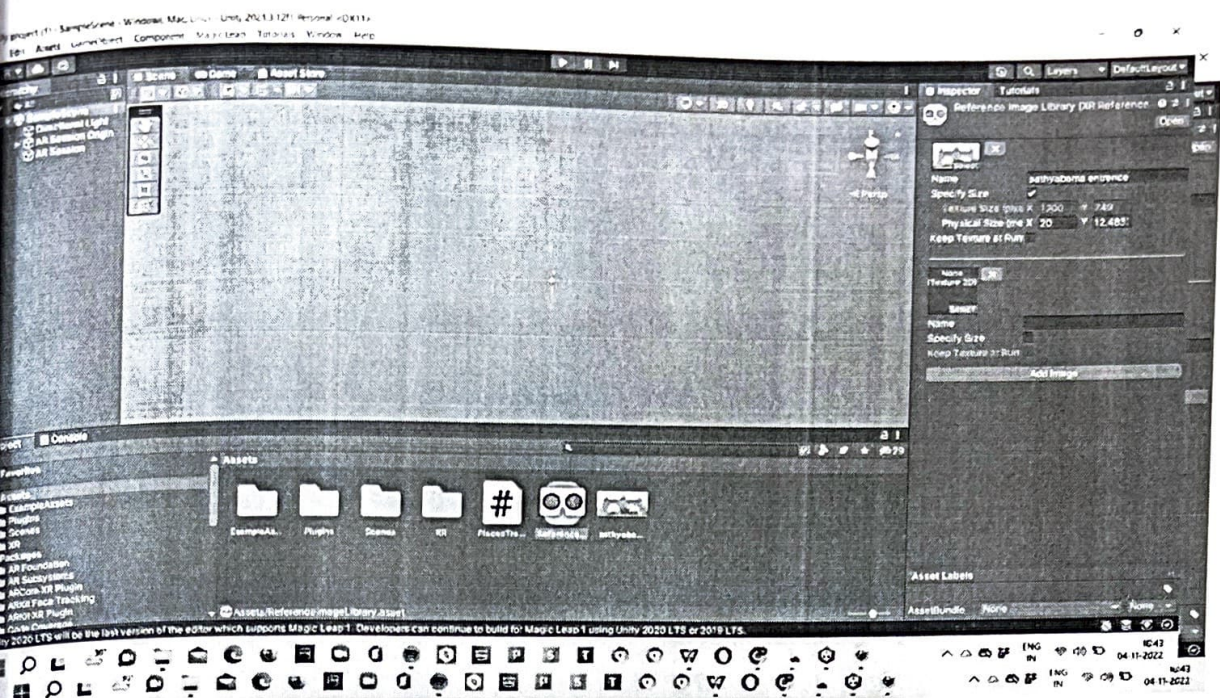


Fig no 3.1.1: UNITY SOFTWARE

3.2 VS code

Visual Studio Code can be a great companion to Unity for editing C# files. All of the C# features are supported and more. In the screen below, you can see code colorization, bracket matching, IntelliSense, CodeLens and that's just the start. Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality. In the Stack Overflow 2021 Developer Survey, Visual Studio Code was ranked the most popular developer environment tool among 82,000 respondents, with 70% reporting that they use it. Unity has built-in support for opening scripts in Visual Studio Code as an external script editor on Windows and macOS. Unity will detect when Visual Studio Code is selected as an external script editor and pass the correct arguments to it when opening scripts from Unity. Unity will also set up a default `.vscode/settings.json` with file excludes, if it does not already exist (from Unity 5.5 Release notes)

INSTALL VISUAL CODE STUDIO

Download the Visual Studio installer, or
open it if already installed. Select **Install**, or

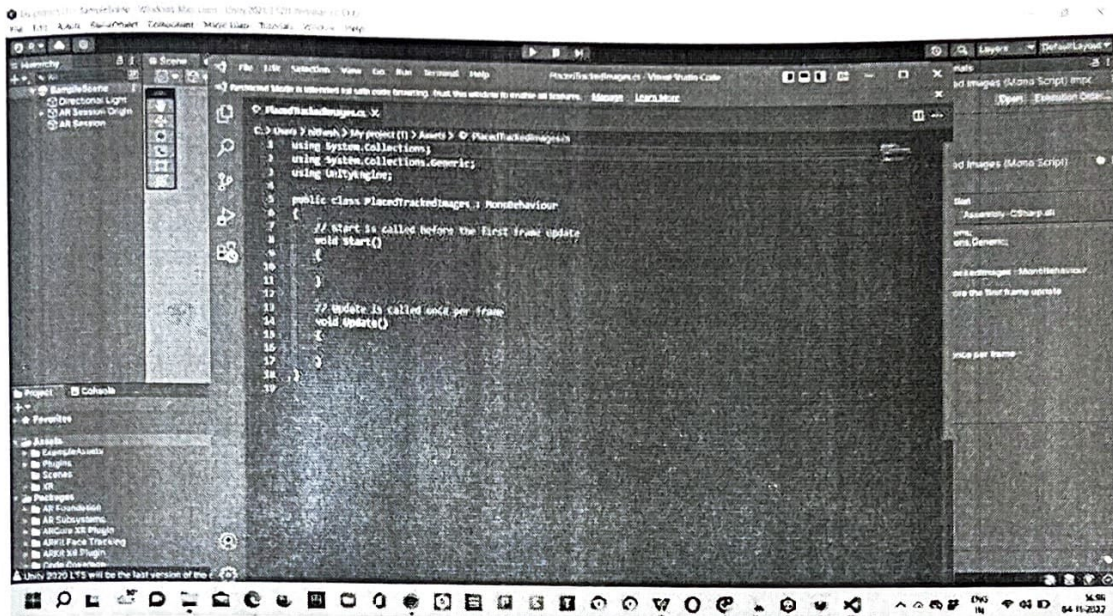


Fig no 3.1.2: vs code

Modify if Visual Studio is already installed.

HARDWARE REQUIREMENTS

- 1) Windows 7 (SP1+), Windows 10 and Windows 11,
64-bit versions only.

2) 2)X64 architecture with SSE2 instruction set

support 3)DX10, DX11, and DX12-capable GPU

A hard disk or fixed disk, is an electro-mechanical data storage device that uses magnetic storage to store and retrieve digital information using one or more rigid rapidly rotating disks (platters) coated with magnetic material. Hard disks are a popular choice for data storage due to several advantages they offer. Firstly, hard disks are a cost-effective storage option compared to solid-state drives (SSDs). This makes them an attractive choice for those who require large amounts of storage space at a lower cost. Secondly, hard disks are available in a wide range of storage capacities, ranging from several gigabytes to multiple terabytes. This makes them ideal for storing large files such as videos, images, and music. Thirdly, hard disks are relatively durable and can withstand some physical shock or movement. They are also less susceptible to damage from environmental factors such as temperature and humidity. Fourthly, hard disks are widely compatible with most computer systems, making them a popular choice for data storage. Additionally, they can be used with older computers and operating systems, making them a reliable and flexible storage solution. Fifthly, hard disks perform well when transferring large sequential files such as videos, audio, or large images. This makes them an excellent option for those who need to transfer or backup large amounts of data.

Lastly, hard disks have a relatively long lifespan compared to other storage options such as flash memory. They can last several years before needing to be replaced or upgraded, making them a reliable and cost-effective storage solution

1990s the typical hard disk drive for a PC had a capacity of about 1 gigabyte. As of January 2019, desktop hard disk drives typically had a capacity of 1 to 6 terabytes, with the largest-capacity drives reaching 15 terabytes

3.2.2 RAM

Ram is a type of data storage used in computers that is generally located on the motherboard. This type of memory is volatile and all information that was stored in RAM is lost when the computer is turned off. The RAM chip may be individually mounted on the motherboard or in sets of several chips on a small board connected to the motherboard. Older memory types were in the form of chips called dual in-line package (DIP). Although DIP chips are still used today, the majority of memory is in the form of a module, a narrow printed circuit board attached to a connector on the motherboard. The three main memory circuit boards types containing chips are: RIMMs (Rambus in-line memory modules), DIMMs (dual inline memory modules) and SIMMs (single in-line memory modules). Most motherboards today use DIMMs. Sometimes, people get confused about the difference between

A processor is an integrated electronic circuit that performs the calculations that run a computer. A processor performs arithmetical, logical, input/output (I/O) and other basic instructions that are passed from an operating system (OS). Most other processes are dependent on the operations of processor.

CHAPTER 4 METHODOLOGY

4.1 HOW IT WORKS

In this application the user scan or make camera contact with the location in our university we can say it as a trigger image. The AR campus tour application would use Unity's ARKit or ARCore to detect a trigger image, such as a campus map or a brochure. Once the trigger image is detected, the AR elements would be activated, providing a virtual tour of the campus. The virtual tour would include information about buildings, landmarks, and key features of the campus, as well as virtual tours of classrooms, libraries, and residence halls. Interactive elements, such as virtual markers or icons, would allow users to access information about academic programs, campus services, and student life. A marker based AR application using AR core.

By using Unity, you can create a comprehensive and interactive AR campus tour application that can provide visitors with a unique and engaging experience. AR technology can provide a virtual view of what the campus would look like, and provide visitors with access to important information and resources

The term of AR typically shows up in conjunction with the term Virtual Reality (VR) that can reproduce the entire world in a computer. In fact, there are some important differences between AR and VR systems. The main goal of a VR system is to use technology to replace reality and create an immersive environment. In contrast, the main goal of an AR system is to enhance reality with digital content in a non-immersive way. A simple AR system requires at least three things, a camera, a computational unit and a display. The camera captures an image of the environment, detects the marker and tracking the position of the marker, and finally media in the form of video, 3D, 2D, or text are superimposed

Augmented Reality (AR) works in Unity by using a combination of computer vision, graphics rendering, and input processing techniques to overlay digital content onto the real world.

To create an AR experience in Unity, developers typically use AR development kits or frameworks such as ARCore or ARKit. These frameworks provide a set of tools and libraries to detect and track the position and orientation of real-world objects and surfaces in real-time, and to render virtual objects onto them. Here are some of the basic steps involved in creating an AR experience in Unity:

Set up the AR environment: This involves defining the tracking and rendering settings for the AR experience, such as the camera settings, the tracking algorithm to use, and the lighting conditions.

Import and position 3D models: Virtual 3D models are imported into Unity and positioned relative to the real-world environment. This can involve aligning the virtual object to the tracked surfaces or objects.

Apply materials and textures: Virtual objects can be made to look realistic by applying materials and textures that match the lighting conditions of the real world.

Implement user interaction: Users can interact with the AR experience using various input methods, such as touch or gestures. This involves implementing user interface elements such as buttons or menus.

Test and refine the experience: The AR experience is tested on different devices and in different environments to ensure that it works as intended. Any issues or bugs are identified and fixed, and the experience is refined to improve performance and user experience.

Overall, Unity provides a powerful platform for creating immersive and interactive

In order to presents information in a correct real world context, the AR system needs to know where the user is and what the user is looking at. There are two common approaches to employing AR to present the information, that is marker- based system and marker-less system.Marker-based AR systems uses specific visual cues such as a logo or any other simple graphic to call up the information or virtual object from a database to be overlaid to physical-world.Augmented Reality or AR is a mixture of the real and digital worlds, making events easier to interact with. This technology is most useful in driving, sport, and other events. Primarily, AR technology allows people to build up a new world foundation by embracingboth real and digital worlds. Pokemon Go and other AR-based games are an example of what this technology can do. But there are Advantages and Disadvantages of AR to consider, from productiveness to ill effects.The device then downloads information about the object from the cloud,

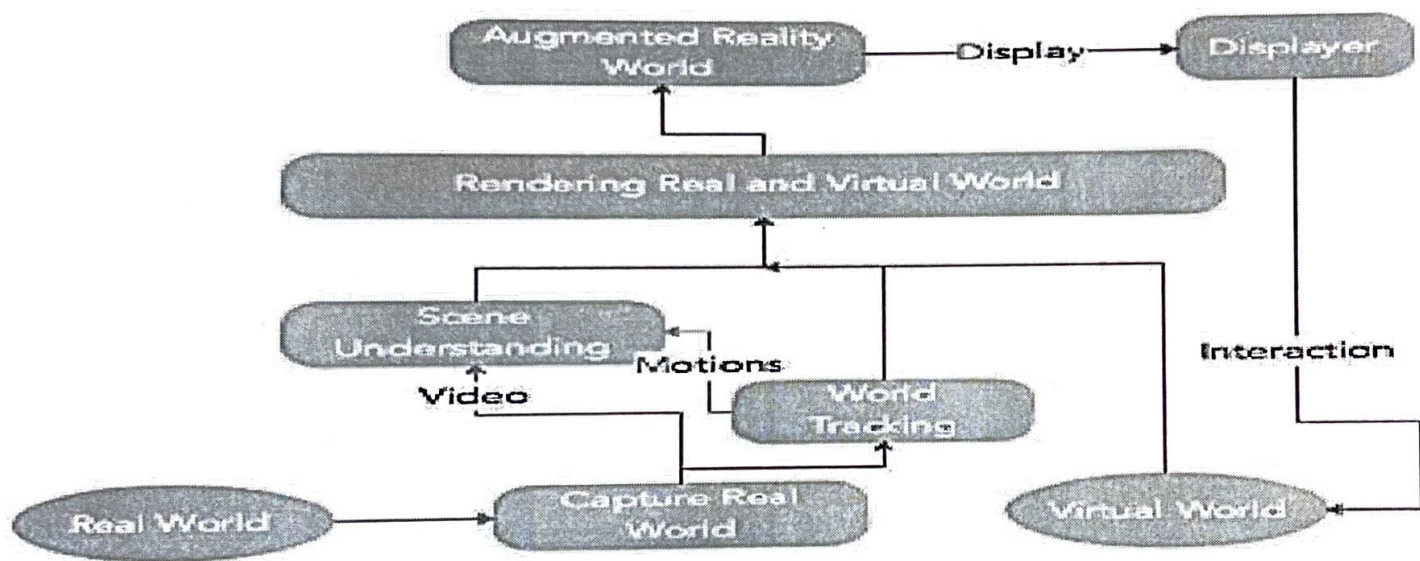


Fig no. 4.1.1:architecture diagram

AR information is presented in a 3-D “experience” superimposed on the object rather than in a 2-D page on a screen. What the user sees, then, is part real and part digital AR can provide a view of the real-time data flowing from products

and allow users to control them by touchscreen, voice, or gesture. For example, a user might touch a stop button on the digital graphic overlay within an AR experience—or simply say the word “stop”—to send a command via the cloud to a product. An operator using an AR headset to interact with an industrial robot might see superimposed data about the robot’s performance and gain access to its controls. As the user moves, the size and orientation of the AR display automatically adjust to the shifting context. New graphical or text information comes into view while other information passes out of view. In industrial settings, users in different roles, such as a machine operator and a maintenance technician, can look at the same object but be presented with different AR experiences that are tailored to their needs. A 3-D digital model that resides in the cloud—the object’s “digital twin”—serves as the bridge between the smart object and the AR. This model is created either by using computer-aided design, usually during product development, or by using technology that digitizes physical objects. The twin then collects information from the product, business systems, and external sources to reflect the product’s current reality. It is the vehicle through which the AR software accurately places and scales up-to-date information on the object. Augmented reality starts with a camera-equipped device—such as a smartphone, a tablet, or smart glasses—loaded with AR software. When a user points the device and looks at an object, the software recognizes it through computer vision technology, which analyzes the video stream. Since the starting era of computer technology, people have dreamed of a future where it can enhance what they see and experience in the world around them. Augmented Reality (AR) is bringing that future a little closer by using digital technologies to overlay information onto the physical world. While augmented and virtual reality are often grouped together, they don’t work the same way and serve different purposes. As mentioned before, **augmented reality (AR)** includes a virtual overlay in a real-life environment. The user still sees the physical world, only his view is enriched by AR animation and data. Almost any person with a smartphone can get access to AR, no additional devices are necessary. Although augmented reality usually gets all the spotlight, there is another AR — **assisted reality**. Unlike augmented

reality, it is a reality first experience. Information isn't overlaid on top of the real world. Instead, the user sees a screen within their immediate field of vision. Augmented reality is one of those quirky things that are good.

most consumers have already come across, but may not know the name of. The technology is clearly on the rise (with an estimated 1.73 billion people using it by 2024), so numerous businesses are finding ways to implement it in their workflow. If you're looking at AR as one of the potential technologies to integrate into your business processes, it will surely help to learn how it works first. The best thing about AR is that all it takes to use the technology is a smartphone. In fact, any device with a camera and the right AR software installed can utilize this technology. Besides smartphones, this includes tablets, laptops, but also smart glasses.

To summarize, to use AR, you will need a device with an up-to-date operating system (usually Android or iOS), a camera, and an appropriate AR app.

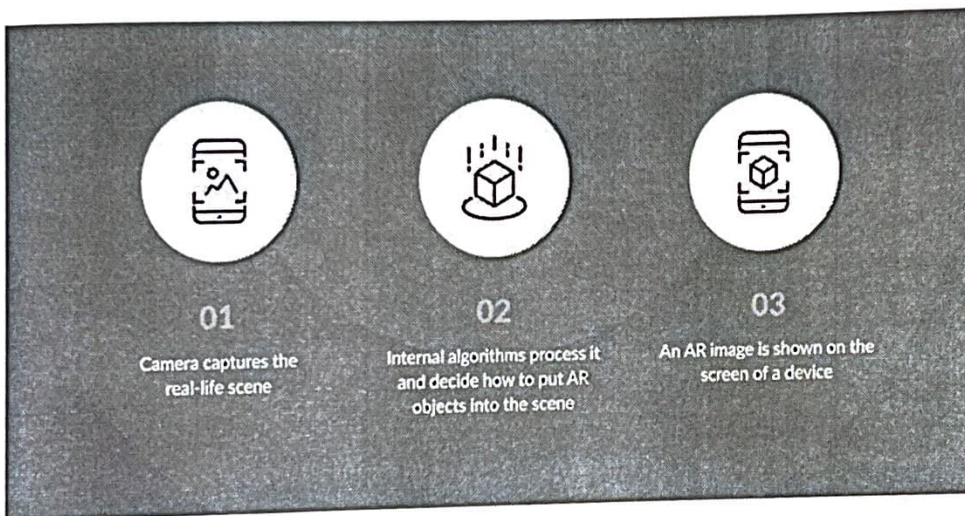


Fig no 4.1.2:work flow

Many augmented reality apps rely on a printed image in order to function, this image is known as an augmented reality tracker. Therefore an augmented reality

(AR) tracker is a specific pattern or image that an augmented reality app can recognize.

4.2 TYPES OF TRCKING

The tracking module is a key of the AR system, which calculates the relative pose of the camera in real time . In order to register virtual content in the real world, the pose must be determined. The term “pose” means the six degrees of freedom (DOF) position,such as the 3D location and 3D orientation of an object.The process to determine and updating the pose of the viewer relative to a previously known pose is called tracking. Therefore, it is common to discuss different tracking techniques used for registering virtual content in the real world for the purposes of mobile AR.AR superimposes digital imagery into your field of vision, meaning it partially or fully replaces your un-augmented view. Within this basic interpretation, there are a few different types of augmented reality. Here's what to know.

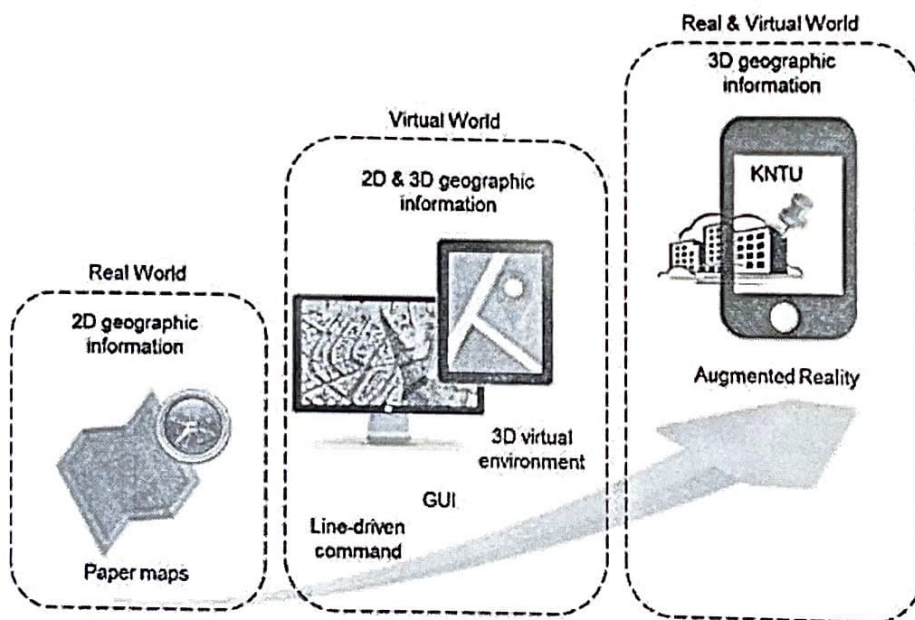


Fig 4.2.1:marker based tracking

4.2.1 Marker Based Tracking

The simplest way and most often used technique to achieve AR is marker-based tracking. Marker-based AR uses a camera and a visual marker to determine the center, orientation, and range of its spherical coordinate system. Initially, the visual marker is a square image with a black or white border, and during the tracking phase, the system searches for this rectangle border. One of the problems in marker-based technique is that the marker always has to be seen and cannot be obscured by other objects during the augmentation. This problem can be partially reduced by remembering marker position and refreshing its position accordingly with device movement. Natural feature tracking and model based tracking is the further development of marker based tracking, which makes it possible to scan various type of images and 3D objects. Marker-based augmented reality experiences require a static image also referred to as a trigger photo that a person can scan using their mobile device via an augmented reality app. The mobile scan will trigger the additional content (video, animation, 3D or other) prepared in advance to appear on top of the marker. Marker recognition can be local or cloud-based, it means that marker databases can be stored on device and recognition also happens on device. The trigger image (marker) has to be unique, avoid using stock photos by all means (if you are using apps which are cloud recognition based) as these may already be utilized by other projects or apps. It's better to capture your unique content or create a custom design to avoid such issues.

4.2.2 Natural Feature Tracking

The natural feature tracking (NFT) uses the objects or images in real world as markers by recognizing their natural cues of real elements such as a

edges, surface texture, or interest points. Natural feature tracking can be applied to almost any image as long as the image is complex enough. An example of a natural feature tracking application is a mobile application that can recognize a cover book and identify it by comparing to similar images of cover book found on the internet. Unlike AR solutions that use markers as their basis for recognition, natural- feature tracking solutions can be applied to almost any image as long as the image is complex enough. An example

of a natural-feature tracking application is a mobile application that can recognize a movie poster. With natural-feature tracking, the application can analyze the poster and identify it by comparing the poster image to similar images. In contrast, a marker-based solution requires a special identifier to be included on the poster; it would be the marker that provides the identification rather than the poster image

4.2.3 Marker-less Tracking

Marker-less AR systems uses built-in components in a mobile devices such as accelerometer, compass and location data (GPS) to determine the position in the physical world which way it is pointing and on which axis the device is operating. Further more, the fuse of data from multiple sensors in this tracking method is called the hybrid based tracking. Markerless AR merges digital data with input from real-time, real-world inputs registered to a physical space. The technology combines software, audio, and video graphics with a smartphone's or headset's cameras, gyroscope, accelerometer, haptic sensors, and location services register 3D graphics in the real world. Markerless AR detects objects or characteristic points of a scene without any prior knowledge of the environment, such as walls or

intersection points. The technology is often associated with the visual effect that combines computer graphics with real-world imagery. The first markerless systems used a device's location services and hardware to interact with available AR resources and define its location and orientation in space.

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Markerless tracking is a method of tracking the position and orientation of real-world objects in an AR environment without the need for physical markers or special patterns. Instead, it relies on computer vision algorithms to analyze the environment and detect features such as edges, corners, or textures, which are used to calculate the camera's position and orientation relative to the real world

One of the main advantages of markerless tracking is that it allows for a more natural and intuitive AR experience, as users can interact with the virtual content in a more seamless and intuitive way. It also allows for greater flexibility in terms of the types of objects that can be tracked and the environments in which AR experiences can be created

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4.2.4 Location based Tracking

Location based AR ties augmented reality content to a specific location. Imagine walking in a city street you're not familiar with and through your phone's camera seeing a virtual road sign displaying the street name, this is location based AR. And exactly what our AR City app provides, it also allows you to navigate to your destination with directions displayed right on top of the physical roads in front of you. You might also be familiar with a simpler example of location based AR -- Pokemon Go. Placing virtual objects anchored to the real world is useful for a wide variety of applications, from walking directions to place labels, treasure hunts or even virtual tourist guides and local information. You can place virtual objects right on top of the physical space for example a city street, an indoor shopping centre or an airport. But to make sure the digital AR content appears in exactly the right place, your device must accurately figure out its location. The AR City app relies on a combination of GPS,

the compass sensor on your phone, and Blippar's own computer vision system called Urban Visual Positioning, to place virtual objects at the right location.

4.2.5 Hybrid Based Tracking

Most of mobile devices such as smartphone and tablet today have built-in sensors that present new opportunities for hybrid tracking. Hybrid tracking systems fuse the data from multiple sensors such as GPS (Global Positioning System), compass, gyroscope, or accelerometer to add additional degrees of freedom and calculate actual position and orientation. GPS allows pinpointing current location of the device to find objects in the area that are to be augmented, compass used to tell the direction of the device and check if that path has any objects to be augmented, gyroscope is used as a prediction for the feature tracker and the accelerometer is used to calculate orientation of the device using gravitation. Combining of technologies gives advantages for this system. The weakness of one technology can be compensated by another solution. As we could already see from the previous sections on vision-based and on inertial tracking, the fusion of complementary sensors should be used to build better tracking systems. Synergies can be exploited to gain robustness, tracking speed and accuracy, and to reduce jitter and noise. Hybrid tracking has been used by many groups (e.g. GPS, electronic compass and inertial sensors; inertial and optical sensors [Azuma et al., 1999], magnetic and vision-based [Auer and Pinz, 1999]), and even most of the commercially available products combine several kinds of sensors. Aiming at a fully mobile tracking system, a combination of vision-based inside-out tracking and inertial tracking is especially well suited

4.3 Methods used

Overlay AR

Typically, this AR is used to replace the original view of an object with an updated virtual image of that object for the human eye. Overlay AR provides multiple views of a target object with the option to display additional relevant information about that object. Augmented Reality Overlay refers to the digital data that overlays the real-world environment shown through the phone's camera. Anything that is in the physical world can have a virtual element designed to interact with it. A product's packaging can include a QR code to scan. The user then scans that code and the unique AR experience is activated through the user's phone's browser. Digital elements are then introduced in concert with the physical packaging, as if interacting with it and bringing it to life. More information can be shared about the product, or something fun like an animated character can build a more positive relationship with the consumer. AR Overlay has ever-growing potential as technology and speeds improve. The futuristic idea where a user wears glasses that can see AR overlay wherever they look doesn't seem very far off. As companies and tech companies look toward the future for AR, right now it is working as an innovative tool for advertising. By providing an interesting or fun experience for new or existing customers, a brand can surpass their competition by utilizing this creative method.

Counter based ar this technology, through the use of special cameras, is used for human eyes to outline specific objects with lines to facilitate certain situations. For example, it can be used for car navigation systems to enable safe driving in low visibility situation

Superimposition AR involves either partial or full replacement of an original view of an object with an augmented view of the same object. In this type of AR, object recognition plays a vital role because an app cannot replace an original object with an augmented one if it cannot identify the original object. This type of AR has been popularized by social platforms such as Instagram, Facebook, and Instagram using filtersIt can also be used to enhance a historical tour. For example, you could use superimposition-based AR to showcase what a statue or structure looked like years ago, visually explaining how it has aged and why that's significant.

As its name suggests, projection-based AR projects immersive light onto a flat surface to create 3D imagery. It then uses SLAM to detect human interaction with the augmentation. For instance, the projection-based AR can be used to create holograms that can be used for business purposes or just for fun.

Projection-based AR, also known as projection mapping or spatial augmented reality, involves projecting digital content onto real-world surfaces to create an interactive and immersive AR experience. This can be done using a variety of projection technologies, such as projectors, LED screens, or holographic displays

AR technology often uses SLAM (simultaneous localization and mapping): a computer vision algorithm that compares visual features between camera frames in order to map and track the environment. In combination with sensor data from the smartphone gyroscope and accelerometer, it is possible to achieve very reliable tracking SLAM (simultaneous localization and mapping) is a method used for autonomous vehicles that lets you build a map and localize your vehicle in that map at the same time. SLAM algorithms allow the vehicle to map out unknown environments. Engineers use the map information to carry out tasks such as path planning and obstacle avoidance Consider a home robot vacuum. Without SLAM, it will just move randomly within a room and may not be able to clean the entire floor surface. In addition, this approach uses excessive power, so the battery will run out more quickly. On the other hand, robots with SLAM can use information such as the number of wheel revolutions and data from cameras and other imaging sensors to determine the amount of movement needed. This is called localization. The robot can also simultaneously use the camera and other sensors to create a map of the obstacles in its surroundings and avoid cleaning the same area twice. This is called mapping SLAM is useful in many other applications such as navigating a fleet of mobile robots to arrange shelves in a warehouse, parking a self-driving car in an empty spot, or delivering a package by navigating a drone in an unknown environment. MATLAB and Simulink provide SLAM algorithms, functions, and analysis tools to develop various applications. You can implement simultaneous localization and mapping along with other tasks such as sensor fusion, object tracking, path planning and path following. SLAM algorithms are tailored to the available resources and are not aimed at perfection but at operational compliance. Published approaches are employed in self-driving cars, unmanned aerial vehicles, autonomous underwater vehicles, planetary rovers, newer domestic robots and even inside the human body.

4.4 Features in Mobile Augmented Reality Campus Tour

Content and media are the key when creating meaningful campus tour application. The effective and user-centered campus tour application is not only provide users with the environmental information, but also allow users to quickly access useful features and increase environmental awareness. Based on the table of previous literature above, there are several useful features that can be applied to mobile AR campus tour application, and in this section we will discuss each of these features. Exploring colleges in virtual reality is a great way for students to discover their preferences for future college choices, as they can visit many different types of universities. From rural students attending major universities in major cities to international students, everyone gets a better idea of what studying abroad looks like than staying at home and exploring a campus from the sofa. It's another great way to help students think about college and prepare for the transition to higher education

Virtual Tours: The AR application can incorporate virtual tours of classrooms, libraries, and dorms to provide users a virtual impression of the facilities' appearance and the kinds of services and resources they might offer.

Easy Navigation: The AR program's user-friendly design makes it simple for users to find the information and resources they require within the application. The tracking and image recognition tools required to maintain the virtual elements' alignment with the real world are provided by Unity's AR engine.

Accessibility: Users can readily access an AR campus tour application using a mobile device, such as a smartphone or tablet. The app may be obtained through the app store and installed on the device,

Cost-Effective: Developing an AR campus tour application using Unity is cost-effective, as Unity provides a complete solution for creating AR applications, including the AR engine, 3D modeling tools, UI tools, and cloud services. This reduces the development time and costs associated with creating an AR

Shows the Events and Activities around Campus:Information related to student events and activities can also be used as one of the features in mobile AR campus tour applications.Mobile Campus Touring System for Beijing Normal University,designed to shows the activity within campus area. When the application started, the GPS information will be accessed and then POI information will be loaded relative to user's location.When the user points the smartphone camera, for example, to the library building, a virtual object which represents the library building will be appear on the screen. User could click this virtual object and get more detailed activity information of library for learning

Navigation within Campus Area:Navigation feature is another important point for a campus tour application to help the users find their destination, since the campus normally has a large area and consists of various buildings. Most of applications that have this feature such as still rely on third-party map application which means that the navigation provided is not overlaid into the existing reality. However, there are some applications that provides different navigation experience. Sunmap+,provides 3D navigation indicators that can be viewed real time on the smartphone camera. AR Game for Mil. Nueva Granada

4.5 creating prefab

Creating prefab is essential for any Augmented Reality that lets you to make digital objects onto the real world using a camera and smartphones. Unity is a popular 3D engine that also supports AR development through its AR Foundation package. You must first start a new project and import the AR Foundation package in order to construct an AR prefab in Unity. Create a 3D object that you want to utilize as your AR prefab after creating an AR Session Origin object. Your 3D object can then be created as an AR Object Anchor, which will track its location and rotation in the actual world. After completing these steps, you may construct your AR prefab by dragging and dropping the 3D object and anchor object into a new folder in the Project window. By instantiating this prefab in the scene, you can use it in your augmented reality project.

It is convenient to build a Game Object in the scene by adding components and setting their properties to the appropriate values. This can create problems, however, when you have an object like an NPC, prop or piece of scenery that is reused in the scene several times. Prefab in Unity refers to a pre-made object or asset that can be reused multiple times in a scene or across different scenes. A prefab can contain any combination of game objects, components, scripts, and other assets.

By using prefabs, game developers can save time and effort by creating a set of objects or assets that can be easily reused and modified without having to recreate them from scratch. Prefabs also provide a way to maintain consistency across a game project, ensuring that similar objects look and behave the same way throughout the game. In Unity, prefabs are stored as separate asset files and can be easily dragged and dropped into a scene. Once instantiated, prefabs can be modified, and any changes made to the prefab will be applied to all instances of that prefab in the game. One of the benefits of using prefabs in Unity is that they can be easily modified and updated. When you modify a prefab, all instances of that prefab in your game will be updated as well. This means that you can make changes to your game objects without having to manually update every instance of that object in your game.

In addition, prefabs can be organized into hierarchies, making it easy to manage and manipulate groups of game objects. This can be particularly useful when working on complex scenes or levels, as it allows you to make changes to multiple objects at once

copying the object will certainly produce duplicates but they will all be independently

editable. Generally, you want all instances of a particular object to have the same properties, so when you edit one object in the scene, you would prefer not to have to make the same edit repeatedly to all the copies

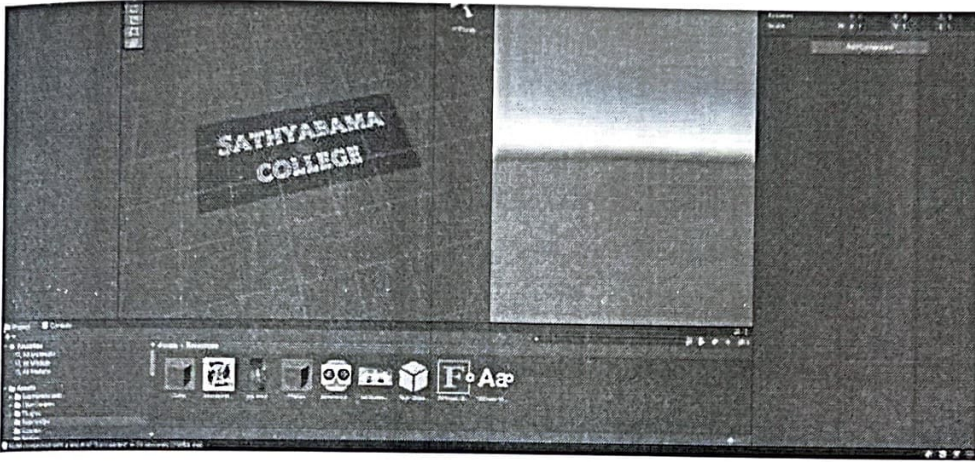


Fig 4.5.1:creating prefab

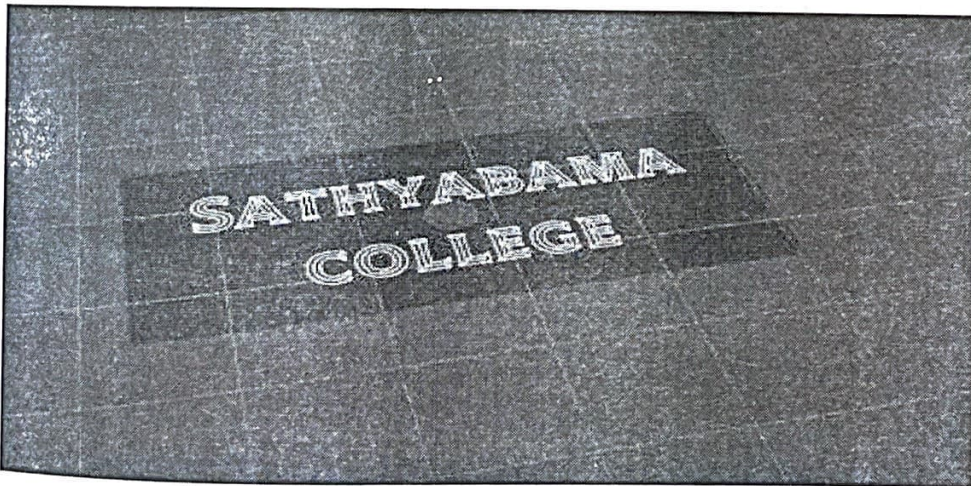


Fig 4.5.2:3d text image

CHAPTER 5 CONCLUSION

This paper presents a survey of various mobile AR campus tour applications along with the features of each application. The main purpose of mobile AR campus tour is to provide the information about campus with innovative approach and allowing the user to become familiar with the campus environment. Information about points of interest and navigation within campus area are the common features that can be found in mobile AR campus tour application. Most of the applications requires the user to be directly on campus location since the trigger for augmented reality is in there. Furthermore, is important to make an option in the application which enable user that far away from campus to get virtual campus tour experience. Mobile AR campus tour application is not intended to replace the traditional campus tour activities that are usually carried out by the campus parties, but it is expected to be a new media that helps these activities become more effective and memorable for the students and campus visitors. From all the research and analysis that I have done, it has already prove that Augmented Reality could enhance the way we design for people. It has proven that with the characteristic of AR, people could comprehend and appreciate design more thoroughly. Indeed with all the supporting resources and analysis, I have to state that AR can change the dynamic of design by making the process more transparent and comprehensive between designer and the community involved On the other hand, to further support my speculation on AR towards architecture and design

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APPENDIX

A. SCREENSHOTS

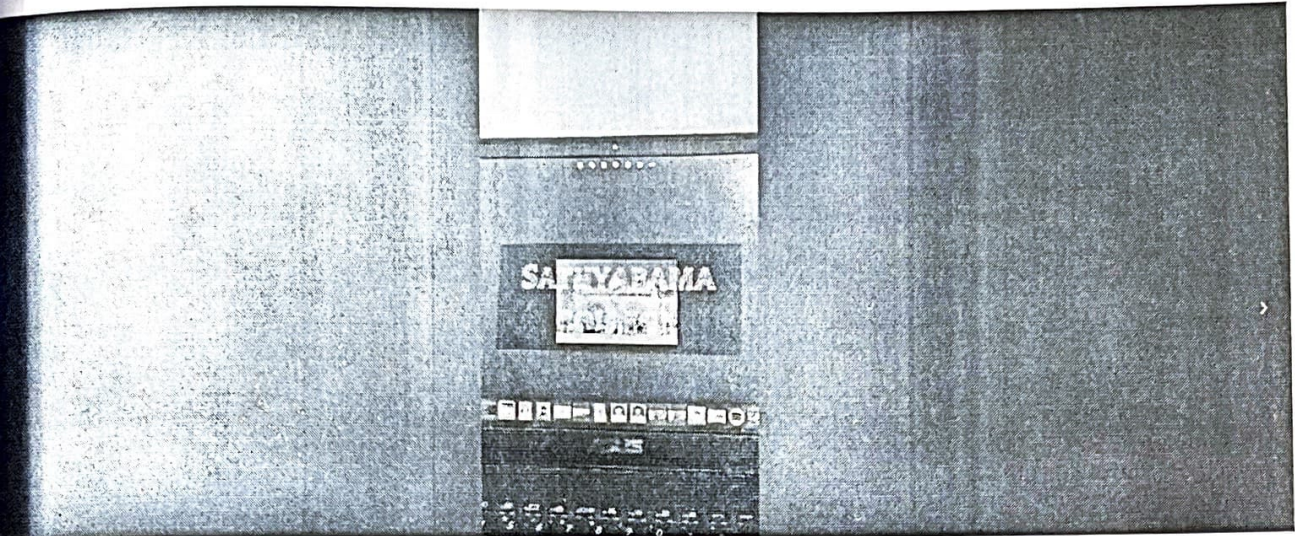


Fig a1:sample output 1

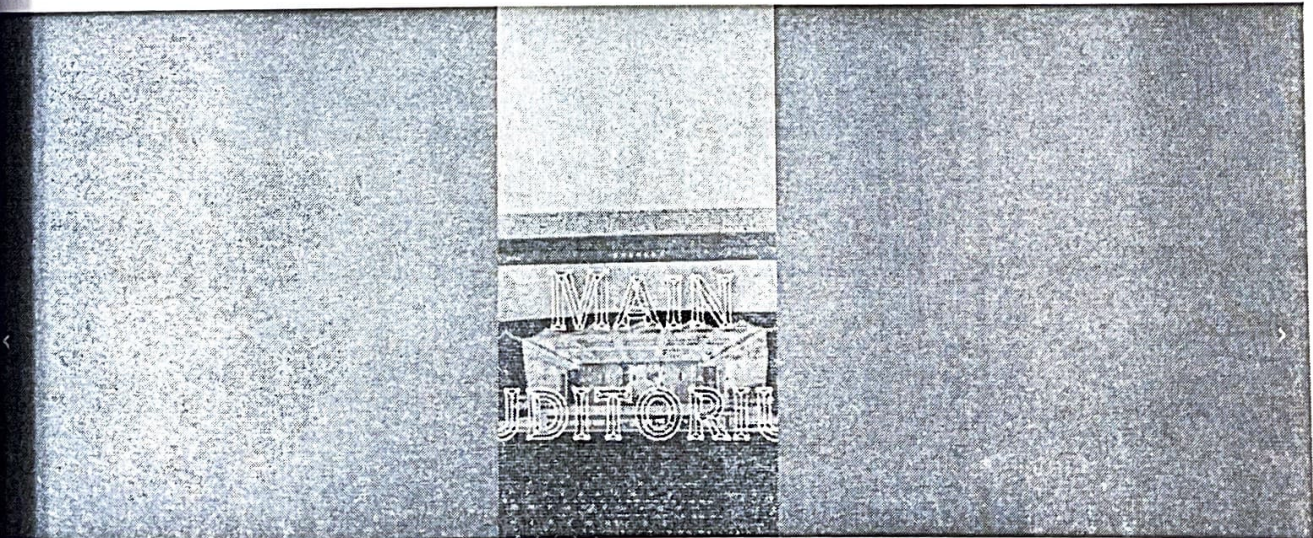


Fig a2:sample output 2

B. SOURCE CODE

```
using UnityEngine;
using UnityEngine.XR.ARFoundation;
using UnityEngine.XR.ARSubsystems;

[RequireComponent(typeof(ARTrackedImageManager))]
// Unity Script (1 asset reference) | 0 references
public class PlaceTrackedImages : MonoBehaviour
{
    // Reference to AR tracked image manager component
    private ARTrackedImageManager _trackedImageManager;

    // List of prefabs to instantiate - these should be named the same
    // as their corresponding 2D images in the reference image library
    public GameObject[] ArPrefabs;

    private readonly Dictionary<string, GameObject> _instantiatedPrefabs = new Dictionary<string, G

    // foreach(var trackedImage in eventArgs.added){
    // Get the name of the reference image
    // var imageName = trackedImage.referenceImage.name;
    // foreach (var curPrefab in ArPrefabs) {
    // Check whether this prefab matches the tracked image name, and that
    // the prefab hasn't already been created
    // if (string.Compare(curPrefab.name, imageName, StringComparison.OrdinalIgnoreCase) == 0
    // && !_instantiatedPrefabs.ContainsKey(imageName)){
    // Instantiate the prefab, parenting it to the ARTrackedImage
    // var newPrefab = Instantiate(curPrefab, trackedImage.transform);
    // Unity Message | 0 references
    void Awake()
    {
        _trackedImageManager = GetComponent<ARTrackedImageManager>();
    }
    // Unity Message | 0 references
    private void OnEnable()
    {
        _trackedImageManager.trackedImagesChanged += OnTrackedImagesChanged;
    }
    // Unity Message | 0 references
    private void OnDisable()
    {
        _trackedImageManager.trackedImagesChanged -= OnTrackedImagesChanged;
    }
}
```

Fig b1:scripting 1

```
// Unity Message | 0 references
private void OnTrackedImagesChanged(ARTrackedImagesChangedEventArgs eventArgs)
{
    foreach (ARTrackedImage trackedImage in eventArgs.added)
    {
        string imageName = trackedImage.referenceImage.name;
        foreach (var curPrefab in ArPrefabs)
        {
            if (string.Compare(curPrefab.name, imageName, StringComparison.OrdinalIgnoreCase) == 0
            && !_instantiatedPrefabs.ContainsKey(imageName))
            {
                var newPrefab = Instantiate(curPrefab, trackedImage.transform);
                _instantiatedPrefabs[imageName] = newPrefab;
            }
        }
    }

    foreach (ARTrackedImage trackedImage in eventArgs.updated)
    {
        _instantiatedPrefabs[trackedImage.referenceImage.name].SetActive(trackedImage.trackingState == TrackingState.Tracking);
    }

    foreach (var ARTrackedImage trackedImage in eventArgs.removed)
    {
        // Destroy its prefab
        Destroy(_instantiatedPrefabs[trackedImage.referenceImage.name]);
        // Also remove the instance from our array
        _instantiatedPrefabs.Remove(trackedImage.referenceImage.name);
        // Or, simply set the prefab instance to inactive
        _instantiatedPrefabs[trackedImage.referenceImage.name].SetActive(false);
    }
}
```

Fig b2:scripting 2

C.RESEARCH PAPER

AR APPLICATION FOR VIRTUAL TOUR OF SATHYABAMA

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Abstract—

Augmented reality is an emerging technology that is transforming the way universities conduct campus tours. AR is a tool that combines real-life objects with virtual information, allowing users to experience a more immersive and interactive tour of the campus. With the integration of AR technology into mobile applications, universities can provide visitors and students with a comprehensive guide of the campus facilities and infrastructure without the need for a physical guide. One of the significant advantages of AR technology is that it can provide a more engaging and interactive experience for users. By superimposing virtual objects onto the real environment, students can better understand the layout and design of the campus. This can help them navigate the campus and find their way around more easily. Additionally, the use of AR can provide a more memorable experience for visitors and students, helping to set the university apart from other institutions. Another significant advantage of AR technology in campus tours is that it can be a more time and resource-efficient solution for universities. With the integration of AR technology, universities can provide virtual tours of the campus, making it easier for students who are unable to visit the campus in person to understand the layout and facilities. This can also be particularly helpful for international students who may not have the opportunity to visit the campus before enrolling. The use of AR technology in campus tours can also be a platform for universities to showcase their sustainability initiatives. By highlighting green buildings, renewable energy sources, and other eco-friendly features, universities can educate visitors and students about their commitment to sustainability. This can attract environmentally conscious students who are looking for universities that prioritize sustainability. campus, set themselves apart from other institutions, and showcase their commitment to sustainability.

Keywords-tracking, overlay AR, slam (Simultaneous localization and mapping)

INTRODUCTION

Our university has many buildings for learning and more than five thousand students are studying and more than 500

staffs are working in this university the large infrastructure may be complicated for the visitors and new comers to our university to solve this problem there is campus tour in every university including our one but by doing campus tour in our traditional way it takes our valuable time and also requires someone to introduce the buildings in our university. To reduce the time and the human effort we can use AR (Augmented Reality) technology. To make it simple for all it takes less than a minute to take phone and get to know about the university and to know different locations in our university. Augmented Reality (AR) is increasingly used in the tourism industry to enhance the experience of visitors. AR technology can provide interactive information about a specific location, such as historical facts, cultural information, or tourist attractions. Additionally, AR can also provide virtual tours and guides, allowing users to explore and navigate a new place without the need for a physical tour guide. Overall, AR has the power to revolutionize the way we experience travel and tourism, providing a more engaging and interactive way to explore new places and cultures. Now a day the technology has become more efficient and user friendly that we can solve any problem using modern technology within a matter of time. AR technology has been so much improved now compared to the past and also will grow in future. Back in the days this technology was used only to make 3d game and animations but thanks to modern AR developing tools such as Unity, Unreal Engine etc. not only in campus tourism it can be used for normal tourism.

2. LITERATURE SURVEY

4 Touring System using augmented reality

The author has developed a tourist application that utilizes augmented reality and a new UI design framework called to provide users with real-time information about tourist attractions. The main objective of the application is to enable users to gain an overall understanding of the tourist sites without requiring a physical tour guide. This is achieved through the use of a backstage database system that automatically updates attraction data, ensuring users have access to the latest information.

C.RESEARCH PAPER

AR APPLICATION FOR VIRTUAL TOUR OF SATHYABAMA

5 Self-guided virtual tour using augmented reality

The author highlights the challenge of limited access to experienced tour guides for nature reserves. They suggest using augmented reality technology as a solution. A smartphone application integrated with AR can provide visitors with the flexibility to explore the reserve on their own schedule. This approach reduces the strain on the limited number of experienced tour guides and provides a more engaging and interactive experience for visitors. Overall, AR technology has the potential to enhance the nature reserve tourism experience

6 Intelligent Touring Recommendation System Using the Deep Learning and Augmented Reality Technology

This author contends that because we are exposed to a wealth of information every day via the Internet, decision-making has become increasingly challenging in recent years. As a result, the recommendation system gains popularity. It can assist users in effectively making selections by offering appropriate ideas, and those suggestions were processed in accordance with users' browsing and transaction histories.

7 Enhancing Rock Painting Tour Experience with OutdoorAR

To further enhance the user experience and provide contextual information, the second stage utilizes feature-based recognition techniques to recognize the rock art and overlay digital information, such as text and images, onto the real-world environment through augmented reality. This system offers a more interactive and informative approach to visiting ancient rock art sites, as visitors can engage with the site on their own terms and learn about the cultural and historical significance of the art. The proposed methodology combines existing technologies in a novel way to create a seamless and engaging experience for visitors, making it a valuable tool for cultural heritage tourism

8 Research study on applying SLAM-Based Augmented Reality technology for gaming history guided tour

The study utilized augmented reality technology based on simultaneous localization and mapping in a guided tour of a historic site. The aim was to enhance users' experiences and real surroundings using virtual objects that blended with the was conducted at the Nishi Honganji Temple in Taiwan, where an innovative technology was used to reconstruct the temple's historical appearance by analyzing literature and

historical documents. The study highlights the potential of augmented reality technology to provide a more engaging and informative experience for visitors to historic sites

9 Augmented Reality Light field Display for a SmartWindow Using an Active Pinhole Array

In order to improve the 3D resolution and visible of real objects, the author proposes a novel technique for realizing an AR light field display that makes use of a limpid display and an (APA). The proposed approach's suitability for applications involving smart windows has been experimentally. Three-dimensional representations of real items can be shown at their locations using an augmented reality (AR) light field display. A traditional AR light field display does, however, have a few drawbacks, including poor 3D resolution and large form due to the usage of an optical combiner or relay

10 Comparing Non-Visual and Visual Guidance Methods for Narrow Field of View Augmented Reality Displays

The author compares two guidance methods for sight objects in augmented reality displays with limited field of view. The first method is a visual approach called EyeSee360, while the second method utilizes audio-tactile signals. A user survey is conducted to evaluate the effectiveness of the two methods in terms of search efficiency and situational awareness. Despite being slower, the audio-tactile approach demonstrates comparable hit rates to that and significantly improves situational awareness. The findings suggest that audio-tactile guidance can be a viable alternative to traditional visual guidance methods in AR displays with restricted field of view, offering improved situational awareness and potentially enhancing user experience

11 An AR/V-Hybrid Interaction System for Historical Town Tour Scenes Incorporating Mobile Internet

The paragraph discusses the author's proposal for a digital engagement system that utilizes hybrid AR/VR technology to enhance historical town tours. By combining mobile internet, AR, and VR technologies, this system aims to provide users with an immersive and interactive experience. The use of UAV photography to capture panoramic views of scenic locations and 3D models of cultural sites adds to the basic data for online engagement, providing users with a more informative experience. This proposed system has the potential to revolutionize traditional historical tours, providing visitors with an engaging and unique experience that incorporates the latest in technology. The incorporation of AR/VR technology in this system will allow users to

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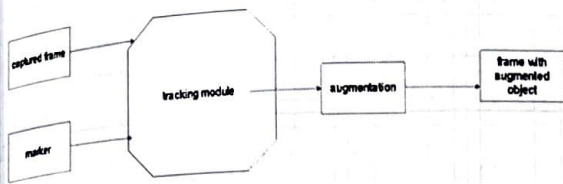


Fig.1 architecture design

explore and learn about historical sites in an entirely new way.

12 The Role of AR and VR Technologies in Education Developments: Opportunities and Challenges

Before defining and introducing virtual reality and augmented reality, the author. Finally, we rapidly go over the most recent AR/VR technologies and studies that have instruction value and the potential to improvise the study systems. In order to establish what advantages AR/VR can provide for teachers and students, we then discuss its advantages and disadvantages.

13 Adoption of mobile augmented reality as a campus Tour Application

The author provides an analysis of the application based on augmented reality that are used at various universities along with a list of each application feature including information, navigation, campus events, ecological tour etc.

3. WORK PROPOSAL

In this application the user scan or make camera contact with the location in our university we can say it as a trigger image. The AR campus tour application would use Unity's ARKit or ARCore to detect a trigger image, such as a campus map or a brochure. Once the trigger image is detected, the AR elements would be activated, providing a virtual tour of the campus. The virtual tour would include information about buildings, landmarks, and key features of the campus, as well as virtual tours of classrooms, libraries, and residence halls. Interactive elements, such as virtual markers or icons, would allow users to access information about academic programs, campus services, and student life. A marker based AR application using AR core.

By using Unity, you can create a comprehensive and interactive AR campus tour application that can provide visitors with a unique and engaging experience. AR technology can provide a virtual view of what the campus would look like, and provide visitors with access to important information and resources

The image then has been tracked using the tracker and the virtual object which in this case information is augmented and the final result we get is the real world object with the augmented object

3.1 TRACKING

The tracking process in this campus tour involves these steps

Image Detection: The AR engine in Unity uses the device's camera to detect the trigger image. The trigger image could be a printed campus map, a brochure, or another image related to the campus.

Image Recognition: Once the trigger image is detected, the AR engine uses image recognition algorithms to identify the trigger image and determine its location and orientation.

Tracking: The AR engine then uses tracking algorithms to follow the trigger image as it moves, ensuring that the virtual elements remain aligned with the physical environment.

AR Activation: Once the trigger image has been recognized and tracked, the AR elements are activated, providing the virtual tour of the campus. The virtual elements are overlaid on the physical environment, providing a seamless and immersive experience

3.2 OVERLAY AR

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The overlay of AR elements in an AR campus tour of our university involves displaying virtual elements on top of the physical environment. This gives the illusion that the non-physical elements are part of the real environment. The AR engine in Unity uses the mobile camera to detect the trigger image and the position and orientation of the device to determine where to place the virtual elements in the physical environment.

In an AR campus tour application, virtual elements such as 3D models of buildings, landmarks, and key features of the campus, as well as interactive elements like virtual markers or icons, can be overlaid on top of the physical environment. The virtual elements are positioned and scaled to match the physical environment, providing a seamless and realistic experience.

The AR engine in Unity uses ARKit or ARCore to provide the necessary tracking and image recognition capabilities to overlay the AR elements. The AR elements can be updated and modified in real-time based on the location and direction of the device, providing a dynamic and responsive AR experience.

3.3 FEATURES

Virtual Tours: The AR application can incorporate virtual tours of classrooms, libraries, and dorms to provide users a virtual impression of the facilities' appearance and the kinds of services and resources they might offer.

Easy Navigation: The AR program's user-friendly design makes it simple for users to find the information and resources they require within the application. The tracking and image recognition tools required to maintain the virtual elements' alignment with the real world are provided by Unity's AR engine.

Accessibility: Users can readily access an AR campus tour application using a mobile device, such as a smartphone or tablet. The app may be obtained through the app store and installed on the device,

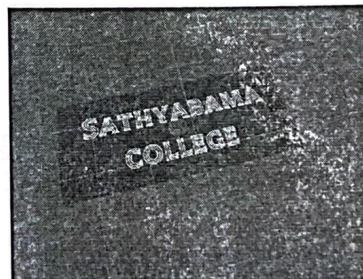
Cost-Effective: Developing an AR campus tour application using Unity is cost-effective, as Unity provides a complete solution for creating AR applications, including the AR engine, 3D modeling tools, UI tools, and cloud services. This reduces the development time and costs associated with creating an AR application from scratch.

3.4 creating prefab

Creating prefab is essential for any Augmented Reality that lets you to make digital objects onto the real world using a camera and smartphones. Unity is a popular 3D engine that also supports AR development through its AR Foundation package. You must first start a new project and import the AR Foundation package in order to construct an AR prefab in Unity. Create a 3D object that you want to utilize as your AR prefab after creating an AR Session Origin object. Your 3D object can then be created as an AR Object Anchor, which will track its location and rotation in the actual world. After completing these steps, you may construct your AR prefab by dragging and dropping the 3D object and anchor object into a new folder in the Project window. By instantiating this prefab in the scene, you can use it in your augmented reality project.



Fig 1. creating prefab



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Fig 2. created 3d text object

Fig 4. created prefabs

4. RESULT AND DISCUSSION

As a result we have shown an overall potential of augmented reality in interactive way possible. We have made marker based augmented reality application which will be useful for new freshers to know about our university. we have used AR core for making this application so a 3D text object which is name of the location will be shown in the device when the marker has been tracked the reference image. as you can see in the below image 3d text object is pop's up when camera is placed in the image

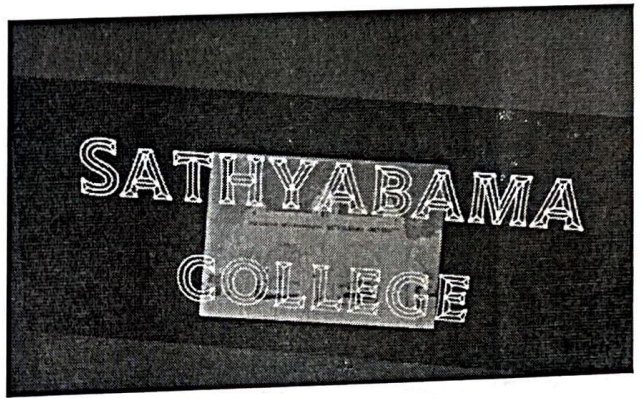


Fig 5.result screenshot

5. PROSPECTIVE IMPROVEMENTS

In future we can add some more features to it by adding voice bots for this system. The user experience of the AR campus tour application can be improved by adding additional features and capabilities, such as voice recognition, natural language processing, and augmented reality sound effects, to provide a more immersive and engaging experience. we can also integrate it with many services. The AR campus tour application could be integrated with other services and platforms, such as campus maps, virtual tours, and social media, to provide a comprehensive and integrated campus experience. we can improve the user interaction by improving the user interface of the application.

6. CONCLUSION

In conclusion, AR application has the potential to provide an even more unique and engaging experience for users to the campus tour, helping them to explore the campus and learn about its features and resources I can state that the AR is going to change the future completely

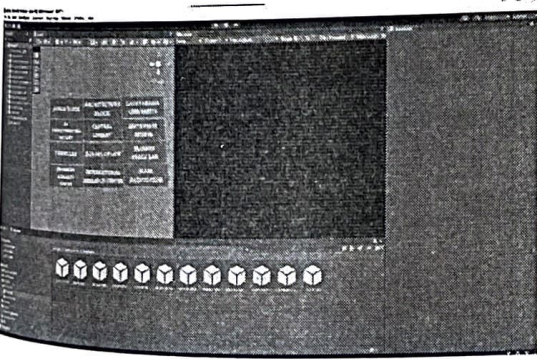
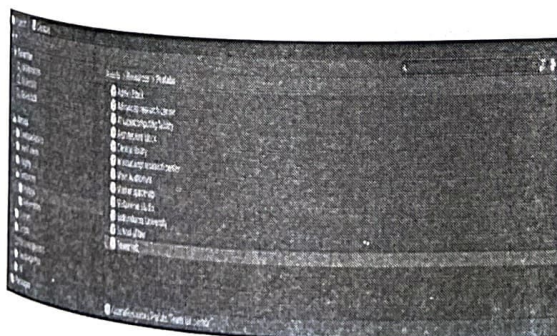


Fig 3. 3d text objects and prefabs



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