

# Development of Augmented Reality Application

Swathi P<sup>1</sup>, Bharathu A<sup>2</sup>, Sindhu Vaardini U<sup>3</sup>  
M.E Students, Department of Construction Management<sup>1,2</sup>  
Assistant Professor, Department of Civil Engineering<sup>3</sup>  
Kumaraguru College of Technology, Coimbatore, India

**Abstract:** *AutoCAD, SketchUp, Unity, and Vuforia were used to create the augmented reality application. Making the floor plan of each floor of the civil department in AutoCAD and creating a 3d model of the outside and interior using those AutoCAD plans in SketchUp, applying the material to the model, and importing or making the component like door, window, table, board, and so on. Importing the SketchUp model into Unity and verifying that the texture was applied correctly, as well as importing the image target into the vuforia website, which will create a database of the image that can be used as an image target in Unity. Using Cscript, create a first-person perspective character controller and export the project as an application. In Lumion, I'm creating a walkthrough.*

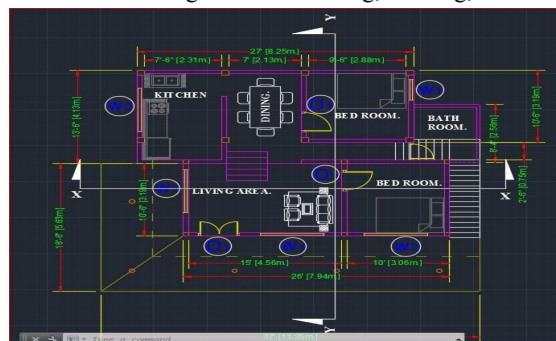
**Keywords:** AutoCAD

## I. INTRODUCTION

AutoCAD, SketchUp, Unity, and Vuforia were used to create the augmented reality application. Making the floor plan of each floor of the civil department in AutoCAD and developing the 3d model of the exterior and interior using those AutoCAD plans in SketchUp with options like rectangle, push, pull, brush, and scale and applying the material to the model and importing or making the component such as door, window, table, board, and so on. Importing the SketchUp model into Unity and double-checking that the texture was applied correctly; if it wasn't, we'll have to build the texture and apply it in Unity. Temperature-controlled baking light for the interior and directing light for the exterior. Making a walkthrough in Lumion by adjusting the material and the developing the surrounding environment with trees, buildings, hills, and road.

## AUTOCAD

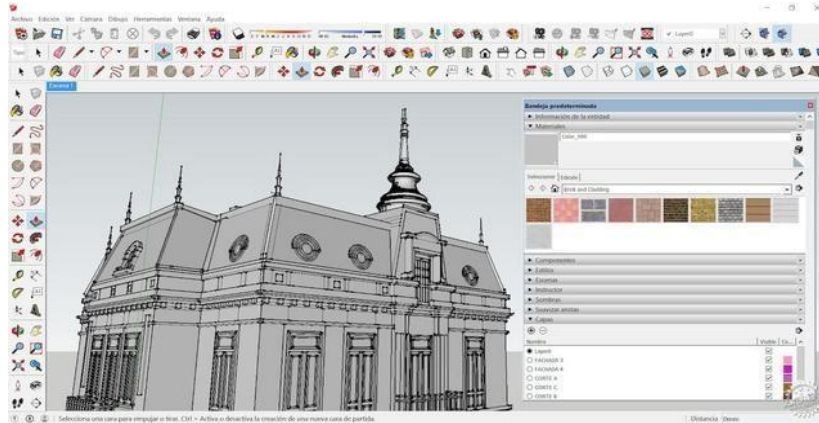
AutoCAD is a 2-D and 3-D design and drafting computer-aided design (CAD) tool. AutoCAD was one of the first CAD systems to run on personal computers, and it was developed and marketed by Autodesk Inc. Creating each floor plan in AutoCAD, including doors, windows, boards, and stairwells, using a variety of tools such as line, rectangle, circle, offset, scale, trim, extend, connect, and explode, among others. The commands listed above are some of the most often used in AutoCAD. AutoCAD is also used to create 2D and 3D drawings, draughts, and papers, as well as 3D models and visualisations. Control the appearance of words, generate dimension styles automatically, link and update data between Microsoft Excel spreadsheets, and more are among the 2D sketching, drafting, and annotating functions.



The major task in AutoCAD was to create a floor plan for each story with the required dimensions and to place the doors and windows in the proper locations so that the 3d model could be modelled.

**SKETCHUP**

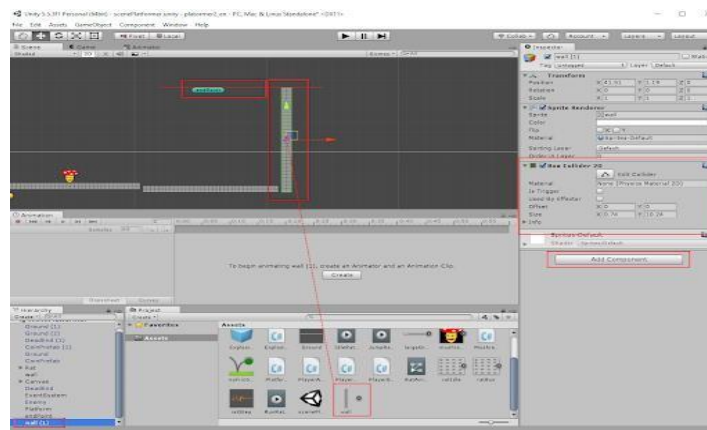
SketchUp is a 3D modelling computer tool used in architectural, interior, landscape, civil, and mechanical engineering, as well as film and video game design.



In comparison to other 3D modelling tools, SketchUp is far more user-friendly and straightforward to use. This is the primary reason for the widespread use of SketchUp by architects. Sketchup is mostly used to create architectural models containing components such as doors, windows, tables, and sofas. We can either get the component off the internet or create it ourselves. Material can be applied to the wall, door, and other components here. If you use more realistic materials, the outcome will be more realistic, and we can use a variety of plugins to achieve photorealistic rendering.

**UNITY**

Unity Technologies created a cross-platform game engine with a built-in Integrated Development Environment. It's used to make games for web browsers, desktop platforms, consoles, and mobile devices. So, once you have the game design and all of the necessary skills, you can use Unity's IDE to put together graphics, sounds, and animations, write the code associated with the assets in the editor, and then generate a playable application that runs in a variety of environments, as one of Unity's features is that it is multi-platform, which means that the same game can run similarly on an iPad or on Windows.



**VUFORIA**

Vuforia is a mobile augmented reality software development kit (SDK) that allows developers to create augmented reality apps. It recognises and tracks planar pictures and 3D objects in real time using computer vision technologies.



Through an extension to the Unity game engine, Vuforia provides Application Programming Interfaces (API) in C++, Java, Objective C++, and the .NET languages. As a result, the SDK allows both native iOS, Android, and UWP development, as well as the creation of AR applications in Unity that are easily shareable across platforms. The main reason we use vuforia is to construct augmented reality by analysing the image target that we upload to the vuforia website and then downloading the image target as a unity database.

## II. CONCLUSION

Architects and interior designers in augmented reality and first-person perspective walking inside the building have enormous potential in the industry, particularly in India, where there is currently no widespread adoption of Virtual Reality and augmented reality by builders or interior designers, nor the changing of colour with 3D models, so now is the right time to turn this project into a start-up idea.

## REFERENCES

- [1] <https://www.archdaily.com/tag/> - for augmented reality ideas.
- [2] <https://www.learnarchviz.com/unreal-engine-arch-viz-workflow-of-unity-for-architect/>.
- [3] <https://academy.allegorithmic.com/> - substance painter.
- [4] <https://library.vuforia.com/articles/Training/getting-started-with-vuforia-in-unity.html>-vuforia integrated with unity interaction.
- [5] <https://docs.unity3d.com/Manual/class-CharacterController.html>-character controller for unity.
- [6] <https://gamedevacademy.org/fps-controller-unity-tutorial/> - unity fps controller.
- [7] <https://lumion.com/blog/faster-3d-rendering-with-6-workflow-boosting-features-in-lumion-10.html>-lumion workflow.