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An Augmented Reality (AR) Experience for Bike Showroom

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Abstract: This project is applied to the concept of AR Bike Showroom Experience (AR.S.E.). The main objective of this application is to give users the ability to see the motorbike they wish to purchase digitally, the user can customize the bike to their liking and generate an invoice giving him an estimate of the same. The user can also view the bike in Augmented Reality, interact with it to see what the real product would be like in their surroundings, and have an overview of the bike beforehand. This application is intended to help users get a sneak peek of the motorbike they aspire to buy. There are other goals the application wishes to achieve. Few of them are - Eliminating the need to physically visit a Bike showroom. Allowing the user to customize and modify the variant of the bike that best suits their taste. Provide comprehensive details about the bike that the user would have to search a lot for. From the Manufacturer side, make the rollout of new models, features, customization options easier and more streamlined.

Keywords: Augmented Reality (AR), Unity 3D Game Engine, Bike Showrooms

I. INTRODUCTION

AR Bike Showroom Experience (AR.S.E.) is an AR-based application intended to be used by potential buyers so that they can view the motorcycle in Augmented Reality. Augmented Reality allows presenting the vehicle in the user's surroundings when they can interact with the vehicle in different ways. The use of Augmented Reality is key as the only thing the user needs is the application and a smartphone and they can access the wide range of vehicles available in the application.

The users can view the vehicle as well as go through the various trims that the vehicle may be available in, as these days there are multiple specifications for the same model the user had the liberty to browse the models and find the vehicle, which exactly meets their needs and expectations. Also, the user can see the specifications of individual components of the vehicle by simply tapping on them in the Augmented space, this allows for an interactive way for the user to get more familiar with the vehicle and its exact specifications. There is also an option to modify the vehicle as per the user's guidelines such as switching a component for another of the same kind of changing the color of those components to present a unique vehicle configuration for the user. For example, the user might like a bike model A but he does not necessarily like the headlights of that model, the user can simply select the headlight of the model and switch it with that of model B of the same vehicle. The same is also true for other components like fuel tank, wheels, fenders, etc. Along with switching components, the user can recolor them if he wishes to.

Potentially the application aims to present the user with an old school showroom/dealership experience right at the comfort of their home with the power of Augmented Reality. The 3-D models used to represent the vehicle are immaculately designed and rendered to present as real as possible to the physical vehicles. The user can place these vehicles in their surroundings using AR and can walk around them, upgrade/modify then in the AR space using just their smartphones, this adds a completely new level of convenience to the vehicle purchasing process and empowers the user to design a vehicle unique to them.

On the technical side of things, we are using Unity 3D to create the 3d models of the vehicles. Unity3D is a powerful cross-platform 3D engine and a user-friendly development environment. The Unity application is a complete 3D environment, suitable for laying out levels, creating menus, doing animation, writing scripts, and organizing projects. The user interface is well organized and the panels can be fully customized by dragging and dropping. Unity can publish to Windows, OS X, and the web via the Unity Web Player. The Web Player is a browser plugin that works in all major browsers and offers the same performance available on the desktop. Unity supports three different programming languages; UnityScript, C#, and Boo. UnityScript is similar to JavaScript and ActionScript, C# is similar to Java, and Boo is similar to Python. We are using C# for bike model animations and modifications as it allows for a streamlined workflow with ample flexibility which is needed in a project of this caliber. It helps in producing highly detailed models of the bikes which aid in user experience as highly detailed renders help in the immersion of the user into the Augmented Reality. C# also helps in creating modularity as in the case of all the models the components are modular, meaning the components can be switched individually without interference with other components.

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A. *Objectives of Augmented Reality (AR) Experience for Bike Showroom*

This approach aims at achieving the following objectives:

1) To provide the user with a comprehensive and detailed preview of the bike he/she desires to eventually buy.
2) To allow the user to easily customize and modify the bike to his/her liking and view it in real time in AR.
3) To generate an invoice for the specification the user chooses giving them a price figure without visiting the actual dealership.
4) To allow the manufacturers to remotely add new bike models, variants, color options, customizations, sticker choices or update existing data of the bikes.

B. *Benefits of Augmented Reality (AR) Experience for Bike Showroom*

1) Significantly easier and quicker for potential buyers to view motorbikes.
2) Buyers can view all the possible modifications and customizations to the various bike models and view them in Augmented Reality.
3) Manufacturers can seamlessly add new models directly to the app instead of the conventional way of shipping the actual bikes to the showrooms.
4) Showrooms do not need to keep many variations of the same model in stock for the buyers to view.
5) AR can enhance the entire viewing experience allowing the buyers to have a much more detailed view of the bike.

C. *Basic Functionality*

Augmented Reality Studio Experience (AR.S.E) allows the vehicle to be presented in the user's surroundings when they can interact with the vehicle in different ways. The use of Augmented Reality is key as the only thing the user needs is the application and a smartphone and they can access the wide range of vehicles available in the application. The user can customize and modify the various bike models in a number of ways and then view them in Augmented Reality. The user can get a detailed description of the bike he/she customized along with an estimate of the bike using the built-in invoice generator.

II. WORKING MODULES

A. *Augmented Reality Studio Experience (AR.S.E) Application Working Module*

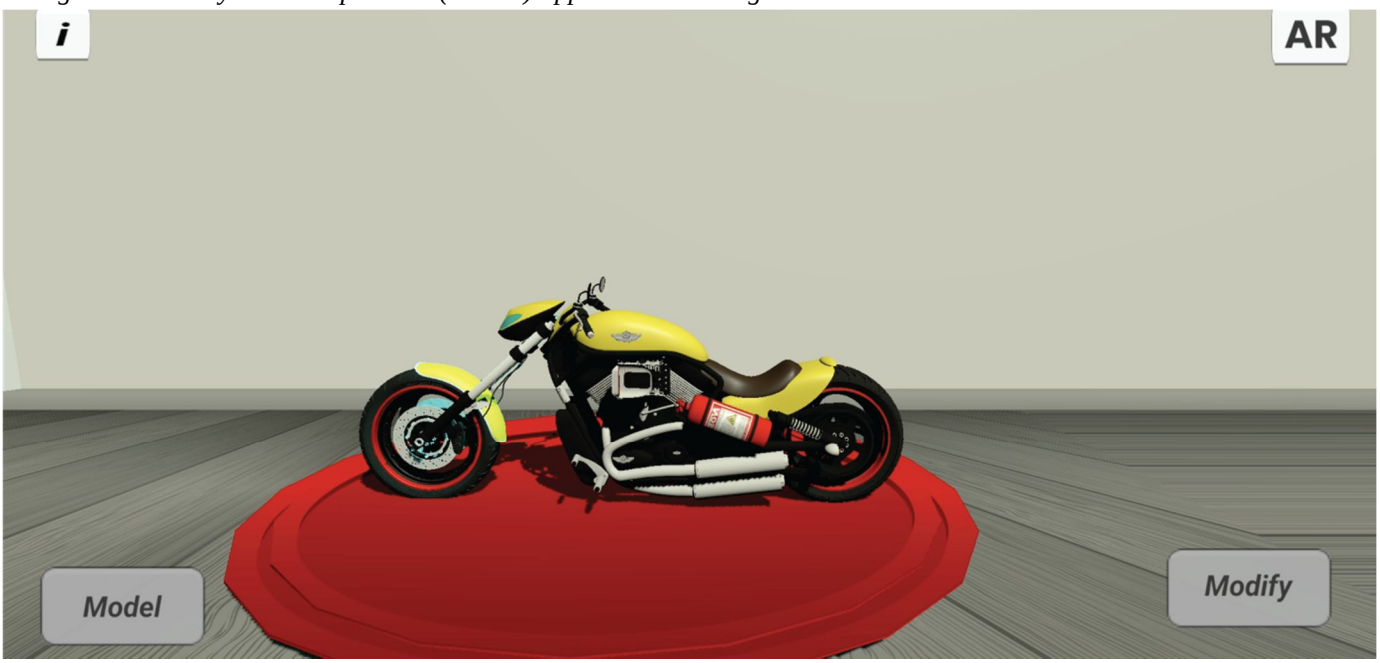

Fig 1: Home Page

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Fig 2: Model Selection Panel

B. Augmented Reality Studio Experience (AR.S.E) Application AR Window

Fig 3: AR image of the Yamaha A150 model

III. CONCLUSION

As per the existing state of bike showrooms, *Augmented Reality Studio Experience* provides a unique and viable solution for the users as well as manufacturers. It allows the buyers the ability to customize and modify the bike to their personal liking to a degree never before seen and gives them a visual representation of the same in their surroundings via Augmented Reality. The buyers get a comprehensive experience which was only possible till now by visiting a brick and mortar store. They also get a detailed description of the vehicle they have designed as well as an invoice for the same.

Manufacturers also benefit from this approach as this gives them the ability to add new models, colors, features, etc. via a simple update in the app instead of shipping physical bikes to all of their stores. It also allows them to better understand what features and modifications the average user desires the most and then work on enhancing them for future updates.

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IV. FUTURE WORK

We see a great potential in this project which could revolutionize the way people make purchasing decisions for their personal transport. In the future we could partner-up with bike or car dealerships to showcase their vehicles on this app, with exclusive rewards and offers for our users. People could save their modifications and send it directly to the dealer where they can customize the bike or car according to the user's need.

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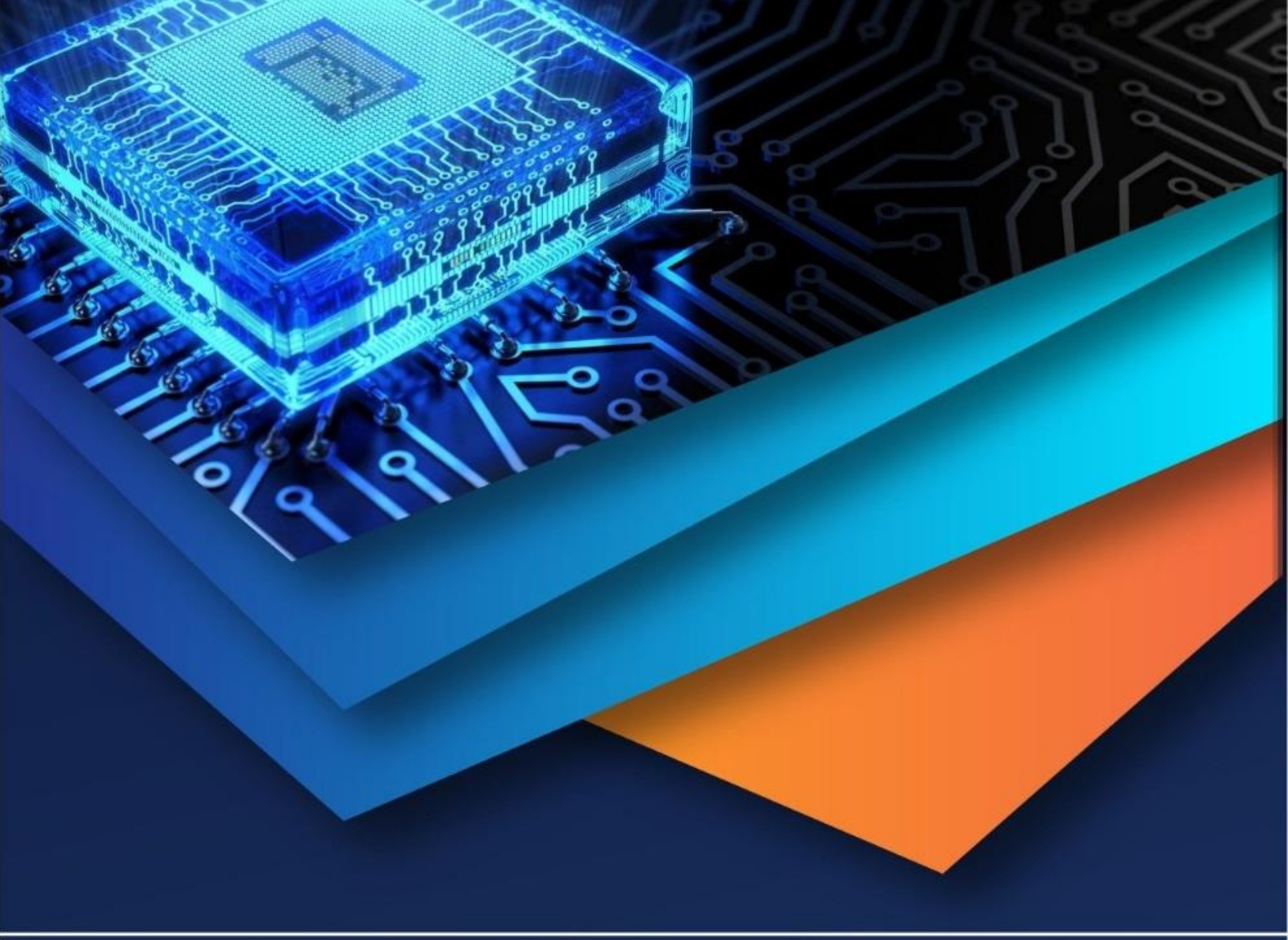

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