

Computerized Automobile Remodelling System

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Abstract- when people buy vehicles, they like to customize it to suit their style and taste. In showrooms, buyers are shown colour models and not full vehicles in many cases, and if the buyer chooses to customize their vehicle with a custom paint job or vinyl (stickers), they do not have a clear idea about the size, fit and placement of the particular vinyl on their vehicle and end up not knowing about how their vehicle will look after modification. There is no proper solution to visualize the changes to be made to the vehicle before making a decision. The proposed solution to this problem is a mobile application capable of visualising changes to their vehicle in real time using Augmented Reality. Customers can simply view their vehicle through the app and make simple changes such as paint colour, vinyl, and so on. This solution reduces the waiting time for the modification and also focuses on saving money for the client while maintaining good levels of quality.

Keywords- augmented reality, automobile system, customize vehicle, real time, application

I. INTRODUCTION

Everyone loves to have their belongings customized and automobiles are no exception. Every year thousands of people apply custom coloring and pattern sticker on their cars. But sometimes people tend to think things through and apply mods that do not go well with their taste and the job ends up being a loss to both the customer and decor staff. Hence there arises a need to preview any mod before applying it. We humans always tend to start our development in a primitive manner and the above said problem was dealt with in the same way too. Dummy stickers and sample photos are used to show the client what the finished car might look like. Because this way the client can get is what the mods looks like on some random car. Though it seems better compared to having nothing, it is a Dark Age approach in today's digital world. So it's time to move on.

The best way to solve this is to create a software that can compute and display what the client's car might look like using the powerful GPU's in 4k monitor, today the world has as many smartphone users as automobile owners if not more. So why not use something that everyone has access to

and can be taken with us rather than using a boring old box? That's right using the all new Augmented Reality (AR) technology to scan the client's car and generate a 3D model of the same using our own smartphone camera. This allows us to apply literally any change we want to the car and watch our own automobile turn into our dream cars, all with the touch of our fingers and with the new generation of smartphones that come with special AR supported cameras and GPUs, such as the iPhone X this solution is way more sensible and smart than a boring old software that runs on our PC at home.

II. EXISTING SYSTEM

A. Hyundai's Augmented Reality Application:

In this modern era everything comes with a digital mind of its own and cars are no exception. Almost all cars that are made today have at least a micro-controller with some basic computational capability. But this doesn't mean that an average person will be able to use those features without reading a huge owner's manual.

To handle this Hyundai has provided its customers with an AR app named Virtual Guide. The purpose of the app is to provide information about the various features of the car. The demo of said app at CES showed that the app is exactly what Hyundai say it is.

Users can view all components of the car in the app. All points of interest are represented as floating dots which upon selection display information about that part of the car. It even includes maintenance walkthroughs and tutorials to explain the modern features of the car.

B. Edmunds Augment Reality

When people buy their cars they check whether it can accommodate their family and luggage but forget to think whether their garage can accommodate the car. This leads to unnecessary garage remodelling and embarrassing situations at office parking spaces.

Edmunds offers a solution to this problem in the form of an AR enabled app that allows users to check whether the

huge SUV that they plan to buy can fit into their garage. The AR feature titled "Can it fit?!" allows iPhone or iPad users who are running IOS 11 to map their garage and check the fit of their dream muscle SUV. This allows users to decide whether to go for that tread-anywhere kind of ride or settle for a good old sedan.

III. WORKING PRINCIPLE

The camera sense the image or object in the front of it then display a 3D model based on the car image or object present in front of the camera.

After detecting we can display an Augmented Reality 3D model in the screen where we can customize the car and check out the changes happened in the model by this way we may get a clue how our car might look after remodeling.

Customization like adding spoiler in the back of the car then changing alloy wheel and paint

We may also change the interior of the car if we have a clear and perfect 3D model of the car. Initially we have used Vuforia SDK to detect and track the image or object.

IV. IMAGE TRACKING

Image Tracking refers to images that can be tracked or detected Rather than traditional fiducial markers, QR codes and data codes. In this there is no need for special black or white regions or patterns to detect it.

Natural features of the image are compared with the target resource database by this way it detects and track the image. Once the target is detected it tries to keep track of the image until the camera's field of view is changed.

Multiple image targets can be fixed for a specific Model or multiple models can have specific target image. Fig.1 shows the image target implementation using Vuforia SDK using Unity.

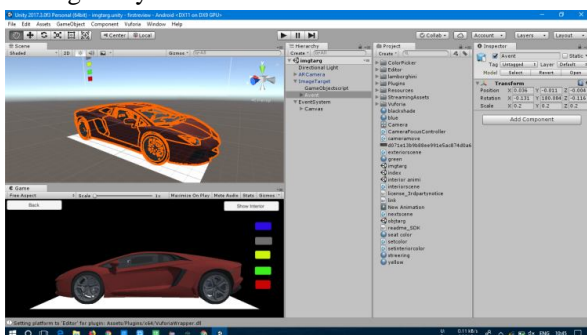


Fig. 1 Example of an Image tracking

V. OBJECT TRACKING

Object Tracking allows recognizing intricate 3D objects which allows detecting toys, other consumer products and other small action figure (cartoon character). This allows developing a rich environment to work with 3D model.

This object tracking bring toy to life by augmenting it with 3D content. Even a user manual can be augmented for customers and interactive training for new employee in industry. Animating the 3D content also helps in maintaining simple electronic device.

In Vuforia SDK the object are scanned before the tracking and converted into a importable package. Basically object are detected by the points that are gathered from the scanning (Fig. 2)

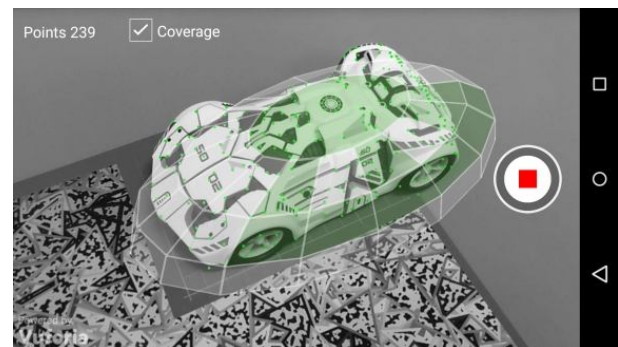


Fig. 2 Object Scanning

VI. MODEL TRACKING

Model Tracking can be additional feature that can be included in this. Model Tracking enables us to detect and track real world object by using the digital 3D model of that object

Model Targets helps in industry and other field of work. Vuforia SDK uses a specific database which is prepared form processing the digital 3D model of the object using Model Target Generator application (Fig. 3). Usually CAD models are preferred since it contains geometry of object with high degree of precision.

Model tracking will help us to develop a AR app which can detect a real world car and display or project a 3D model of that car on the top of the real car by this way it look like a changing the real car instead of the 3D model.

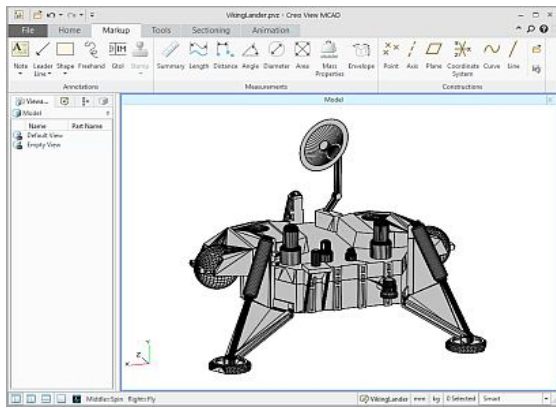


Fig. 3 Model Target Generator application

VII. CONCLUSION

Augmented Reality application that's helps to visualize the car which show how the car will look after the customization. This helps to see the customized car early before the customization process.

VIII. FUTURE ENHANCEMENT

Initially Application main aim is to detect the car and project a 3D model to customize. In future we could also keep track of the car maintenance, repairing cost of the car and AI also can be introduce to enhance the application a bit more.

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