

VIRTUAL MINDSET

EXPLORATORY RESEARCH

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ABOUT OUR CLIENT:

- Company offering IT solutions and technology consulting
- Services to increase effectiveness of technology
- Example companies: Life University, Lenox Financial, Airshares Elite:



SERVICES INCLUDE:

- Fractional CIO Services
- Infrastructure Services
- Managed Services
- Disaster Recovery Planning & Execution
- Custom Application Development
- Security Assessment & Remediation
- Sourcing & Procurement
- VoIP Design & Deployment

WHAT IS AUGMENTED REALITY?

According to Technopedia: "Augmented reality (AR) is a type of interactive, reality-based display environment that takes the capabilities of computer generated display, sound, text and effects to enhance the user's real-world experience. Augmented reality combines real and computer-based scenes and images to deliver a unified but enhanced view of the world."

WHAT CAN IT DO?

AR applications use Object Recognition Markers, such as special images, pictures, or objects, to generate predefined audio, video, animations or computer-generated images.

WHAT IS OBJECT RECOGNITION?

Object recognition is defined as "The ability to perceive an object's physical properties (such as shape, colour and texture) and apply semantic attributes to it (such as identifying the object as an apple.)" In the case of Augmented Reality (AR), it refers to a device's ability to identify the form and shape of different objects and their position in space caught by the device's camera.

WHAT ARE SOME BENEFITS WITH AR?

Current benefits of AR include its excellent ability to be used as a learning tool, accessibility, and its use creative resource. Many upper-level classroom settings are introducing AR into their course curriculum. With the development of AR in mobile devices steadily increasing, people have access to generated images in their day-to-day lives to a longer degree and much greater scale. Creatives have been able to use AR to paint, or decorate their homes. In a few years it will become just as welcomed into the average home as smart objects.

WHAT ARE SOME CHALLENGES WITH AR?

Current issues that exist in augmented reality today include pricing, considering that the majority of highly adept AR is very expensive, this includes mobile devices able to generate the CG. Another issue is the development to generate images that are close and closer to actual life. There's a current issue in the rise of "Deep Fakes," which is a synthesized AI that is designed to superimpose CG faces and emotions onto real people. This can be used dangerously to make celebrities or politicians look and sound like they said one thing instead of another. It's a ongoing threat to privacy and identity that is currently under federal investigation.

WHAT IS THE FUTURE OF AR?

Augmented Reality is making great strides in it's modern usage. However, because technology often moves faster that legal regulations, it is important that entrepreneurs and investors establish a responsible set of ethical codes in the ushering of their products. Even when a standard level of regulation is set, there are always possibilities for AR to be used maliciously. When used wisely, AR can generate the world to be a better place.

MEDICAL USES FOR AR

AR is currently being utilized in the medical field mostly for educational purposes, such as training for medical students. AR can step in and create an opportunity to learn how the human body is structured and how it functions when educational tools such as cadavers become few and far between. AR and VR can aid students in learning about the human body by projecting anatomical models and also simulating patients and/or surgeries. AR's potential in the medical field is growing and could bring about these innovations within the next few years if conditions are right.

COMPETITORS

3D4MEDICAL

- Requires iOS12
- Available for iPhone and iPad
- Educational tool
- “Your 3D anatomy companion from Student through to Professional”

PROS:

- It is very detailed, easily available, has a classroom setting where it goes through the process of procedures, very student oriented.

CONS:

- Uses a virtual model of the subject; there’s no interlay over a physical subject.

3D ORGANON

- VR
- Originally for Oculus Rift
- Now for desktop, mobile, tablet and VR devices
- Educational tool
- Offers a sense of spatial awareness, depth, and scale
- Skeleton, bones, ligaments, heart, arteries, veins, brain, nervous system

PROS:

- Very detailed models; lots of information about the parts of the body and the medical issues that can affect them; lots more detail on the paid versions

CONS:

- Most of the mobile apps are pretty expensive; not very clear how to use it on desktop – you have to apply for a license; the app is not intuitive and it isn’t immediately apparent how to use it

WHAT'S OUT THERE?

OBJECT RECOGNITION

- “Vuforia is a standalone library that allows applications to recognize images, boxes, cylinders, text, and arbitrary objects in the environment. This tool is extremely fast, robust, and is easy to use. Moreover, it is extremely well-integrated into Unity, a leading development engine, since Unity and Vuforia have developed a solid partnership and have a shared R&D lab.”
- Open Source Computer Vision, that is often shortened to OpenCV, is an open-source library of programming functions mainly aimed at real-time computer vision and image processing. This library has a cross-platform nature and is free to use under a BSD license. Basically, OpenCV is a set of filters and operations that can be applied to 2D images.
- The most prominent features of it include edge and transition detection, circle and line detection, smoothing, blurring, perspective recovery, feature point extraction (SIFT, SURF, ORB, etc.), and face detection

APPLE AR KIT 2

- “Build unparalleled augmented reality experiences for hundreds of millions of users on iOS – the biggest AR platform in the world. With ARKit 2 on iOS 12, your AR apps can now be experienced by multiple users simultaneously, and resumed at a later time in the same state. You can also incorporate real-world objects into your AR experiences, giving your users even greater immersive opportunities.”

APPLE VISION

- Detailing for Vision, also has coding for object recognition!
- “The Vision framework performs face and face landmark detection, text detection, barcode recognition, image registration, and general feature tracking. Vision also allows the use of custom Core ML models for tasks like classification or object detection.”

WHAT'S OUT THERE?

SCANNING AND DETECTING 3D OBJECTS

- “The Scanning and Detecting 3D objects features record spatial features of real-world objects, then use the results to find those objects in the user’s environment and trigger AR content.”
- Helpful tips proved by the apple developers:
- ARKit looks for areas of clear, stable visual detail when scanning and detecting objects. Detailed, textured objects work better for detection than plain or reflective objects.
- Object scanning and detection is optimized for objects small enough to fit on a tabletop.
- An object to be detected must have the same shape as the scanned reference object. Rigid objects work better for detection than soft bodies or items that bend, twist, fold, or otherwise change shape.
- Detection works best when the lighting conditions for the real-world object to be detected are similar to those in which the original object was scanned. Consistent indoor lighting works best.

6D.AI

- “The 6Dai Reality Platform is built around a set of innovative cloud services and mobile native SDKs which enhance AR apps. Current AR limits a user to a small area, with no way to occlude objects, where content is lost as soon as an app is closed. Apps built with the 6D Reality Platform use a standard single-lens smartphone camera to build a crowdsourced, three-dimensional semantic map of the world in real-time, users can interact with a full mesh of what their camera sees in less than a second and all maps are stores in the 6D AR Cloud.”

CAPTURE

- Capture is a 3D scanning app developed for the Iphone which is designed to take 3D scans, share them with friends, or save and download them in any file format. It requires the True Depth camera, only available on the iPhone X, Xs, Xr, or Xs Max.

WHAT MAKES OUR PRODUCT DIFFERENT

Compared to the competitors, our product will allow users to overlay part of a skeleton onto their body in real time. In this way, our model will be more interactive and give the user a more up-close and helpful look at the bones in their bodies. Educationally, this may help connect the dots even quicker than other 3D models.

SOURCES

ABOUT OUR CLIENT

<https://virtualmindset.com/>

WHAT IS AUGMENTED REALITY?

<https://www.techopedia.com/definition/4776/augmented-reality-ar>

WHAT IS OBJECT RECOGNITION?

Yang, Ming-Hsuan. "Object Recognition" (PDF). University of California at Merced.

BENEFITS OF AR:

<https://virtualrealitypop.com/object-recognition-in-augmented-reality-8f7f17127a7a>

CHALLENGES OF AR:

<https://techcrunch.com/2018/05/06/we-love-augmented-reality-but-lets-fix-things-that-could-become-big-problems/>

MEDICAL USES FOR AR:

<https://sciencebasedmedicine.org/augmented-reality-in-medicine/>

<https://haptic.al/vr-and-ar-in-medical-education-cd1c90cc3de3>

3D4MEDICAL:

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3D ORGANON:

<https://www.3dorganon.com/>

OBJECT RECOGNITION:

<https://ieeexplore.ieee.org/abstract/document/958588>

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APPLE AR KIT 2:

<https://developer.apple.com/arkit/>

<https://www.tomsguide.com/us/apple-arkit-faq,review-4636.html>

APPLE VISION:

<https://developer.apple.com/documentation/vision>

SCANNING & DETECTING 3D OBJECTS:

https://developer.apple.com/documentation/arkit/scanning_and_detecting_3d_objects

6D.AI:

<https://dashboard.6d.ai/user/dashboard/?view=home>

CAPTURE:

<https://itunes.apple.com/in/app/capture-3d-scan-anything/id1444183458?mt=8>