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Augmented Reality

What is Augmented Reality?

An enhanced version of reality where live direct or indirect views of physical real-world environments are augmented with superimposed computer-generated images over a user's view of the real-world, thus enhancing one's current perception of reality.

The origin of the word augmented is augment, which means to add or enhance something. In the case of Augmented Reality (also called AR), graphics, sounds, and touch feedback are added into our natural world to create an enhanced user experience.

Augmented Reality vs Virtual Reality

Unlike virtual reality, which requires you to inhabit an entirely virtual environment, augmented reality uses your existing natural environment and simply overlays virtual information on top of it. As both virtual and real worlds harmoniously coexist, users of augmented reality experience a new and improved natural world where virtual information is used as a tool to provide assistance in everyday activities.

Types of Augmented Reality

Several categories of augmented reality technology exist. Below, we explore the various types of technologies that make up augmented reality:

Marker Based Augmented Reality

Marker-based augmented reality (also called Image Recognition) uses a camera and some type of visual marker, such as a QR/2D code, to produce a result only when the marker is sensed by a reader. Marker based applications use a camera on the device to distinguish a marker from any other real world object. Distinct, but simple patterns (such as a QR code) are used as the markers, because they can be easily recognized and do not require a lot of processing power to read.

Markerless Augmented Reality

As one of the most widely implemented applications of augmented reality, markerless (also called location-based, position-based, or GPS) augmented reality, uses a GPS, digital compass, velocity meter, or accelerometer which is embedded in the device to provide data based on your location. A strong force behind markerless augmented reality technology is the wide availability of smartphones and location detection features they provide. It is most commonly used for mapping directions, finding nearby businesses, and other location-centric mobile applications.

Projection Based Augmented Reality

Projection based augmented reality works by projecting artificial light onto real world surfaces. Projection based augmented reality applications allow for human interaction by sending light onto a real world surface and then sensing the human interaction (i.e. touch) of that projected light. Detecting the user's interaction is done by differentiating between an expected (or known) projection and the altered projection (caused by the user's interaction).

Superimposition Based Augmented Reality

Superimposition based augmented reality either partially or fully replaces the original view of an object with a newly augmented view of that same object. In superimposition based augmented reality, object recognition plays a vital role because the application cannot replace the original view with an augmented one if it cannot determine what the object is. A strong consumer-facing example of superimposition based augmented reality could be found in the Ikea augmented reality furniture catalogue. By downloading an app and scanning selected pages in their printed or digital catalogue, users can place virtual ikea furniture in their own home with the help of augmented reality.

Applications/uses of Augmented Reality

Medical Training

From operating MRI equipment to performing complex surgeries, AR tech holds the potential to boost the depth and effectiveness of medical training in many areas.

Retail

In today's physical retail environment, shoppers are using their smartphones more than ever to compare prices or look up additional information on products they're browsing. World famous motorcycle brand Harley Davidson is one great instance of a brand making the most of this trend, by developing an AR app that shoppers can use in-store.

Repair & Maintenance

One of the biggest industrial use cases of AR is for repair and maintenance of complex equipment. Whether it's a car motor or an MRI machine, repair and maintenance staff are beginning to use AR headsets and glasses while they perform their jobs to provide them with useful information on the spot, suggest potential fixes, and point out potential trouble areas.

Design & Modeling

From interior design to architecture and construction, AR is helping professionals visualize their final products during the creative process. Use of headsets enables architects, engineers, and design professionals step directly into their buildings and spaces to see how their designs might look, and even make virtual on the spot changes.

Business Logistics

AR presents a variety of opportunities to increase efficiency and cost savings across many areas of business logistics. This includes transportation, warehousing, and route-optimization. Shipping company DHL has already implemented smart AR glasses in some of its warehouses, where lenses display to workers the shortest route within a warehouse to locate and pick a certain item that needs to be shipping.

Tourism Industry

Technology has gone a long way towards advancing the tourism industry in recent years, from review sites like TripAdvisor to informative website like Lonely Planet. But AR presents a huge opportunity for travel brands and agents to give potential tourists an even more immersive experience before they travel.

Classroom Education

While technology like tablets have become widespread in many schools and classrooms, teachers and educators are now ramping up student's learning experience with AR. The

Aurasma app, for example, is already being used in classrooms so that students can view their classes via a smartphone or tablet for a more rich learning environment.