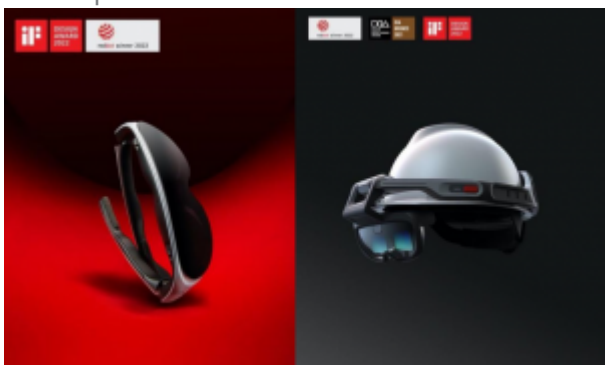
Rokid wins the Red Dot Design Award and iF Design for X-Craft and Rokid Air Pro

14th April 2022



This represents the award-winning product that integrates design and technology to create a better life experience for consumers through the power of technology and aesthetics.

Rokid X-Craft, the world's first explosion-proof MR device passed ATEX Zone 1 certificate and received a design award, being applied to hazardous scenarios such as oil & gas and energy & power.

With remote assistance, remote processing is possible immediately, and X-Craft is equipped with 3 noise reduction microphones, and with an AI algorithm, voices can be accurately detected in a 95db noisy industrial environment.

Now, Rokid's X-Craft has been deployed in over 70 regions. Rokid Air Pro, the Best Portable AR Glasses for Training & Exhibition, has been used in over 60 museums around the world. It's small enough to fit into a pocket, the AR glasses are foldable, look like regular sunglasses, and have a visor for outdoor use.

It's not enough to have the toughest product and advanced technology, Rokid is committed to designing the best user experience. By doing so, Rokid has obtained many world-renowned design awards for its home media terminals.

See Rokid's AREA profile here

Part 3 Magic Leap's Augmented Reality 101

The Future of Work and AR for Business

14th April 2022

AR-enhanced tech support finds solutions faster

The incredibly scalable nature of augmented reality — accessible from dedicated headsets to simple smartphone apps — makes it ideal for remote technical support. For instance, using AR, technicians would no longer have to try to explain a fault in machinery to an engineer since the engineer would be able to see the issue from their own point of view, and potentially diagnose the problem remotely. One of the key metrics for support issues is *time to resolution* — a measure of how much downtime is lost while equipment is offline. AR can help resolve these types of issues more efficiently.

“We have a factory in South Florida and a partner of ours has a factory in Guadalajara,” explained Magic Leap CEO Peggy Johnson when she appeared on the “Leadership Next” podcast. Due to COVID restrictions, “we couldn’t send engineers back and forth. We were trying to bring up our next-generation product and all travel stopped. So we have our own production engineers in Guadalajara who may not be familiar with this new equipment for the next-gen product. They can make calls back to our engineers in South Florida who can see what they see. It’s gotten to the point where I don’t know that we’ll put engineers on airplanes in the future.”

In a recent webinar, Taqtile CCO Kelly Malone noted that frontline workers no longer have to wait for someone to be available or for a supervisor to free up time. “They can reach out to a colleague who’s familiar with the system. And because it’s integrated, they can see [through the device] who recently worked on the machine, who authored the procedure, and who else performed the job. That information is actually right there, at their fingertips, so they can reach out to knowledgeable individuals instead of making a scattershot call and hoping the person they reach out to knows the answer to the question.”

AR visualization means collaborative design

The ability to create detailed 3D models that are viewable in AR means that design teams can work remotely from the same data with greater confidence. Unlike 2D video conferencing, designers can collaborate in AR on prototypes and products while each sees the model as if it were in their hands. AR solutions, like Magic Leap, augment traditional collaboration approaches by not only enabling deeply immersive remote collaboration, but also adding context and knowledge to in-person communication.

This aspect of AR is at the heart of MakeSEA, a design visualization platform available on Magic Leap. Designers can upload 3D computer models of their work to a library, which can then be shared with their collaborators. As the design evolves, so does the model in the library, ensuring everyone is always looking at the most recent iteration.

As with remote assistance, this collaborative function of AR is now helping to shape our next generation headset, Magic Leap 2. “The 2D experience with our current video conferencing doesn’t quite fit the needs that design teams have. We can now gather our teams in my own physical space here. I do it often,” explained Peggy Johnson. “I can bring my teams in using the Magic Leap headset, and we can look at our next-gen product, make changes, move it around, expand it, walk around. It’s really been a tool that’s going to go on post-pandemic.”

AR meetings reinvent the idea of the workplace

Over the past few years, all of us have been getting used to connecting with our teams over video calls rather than around the boardroom table, but inevitably there is a frustrating sense of disconnection that comes with it. The shared space and viewpoint that AR business meetings offer means that they are more collaborative and engaging, as attendees can view and interact with objects rather than sitting passively watching a slideshow.

Spatial is one of several companies using Magic Leap for its virtual meeting platform. Among Spatial’s clients are Mattel, Ford, Purina, and international banking group BNP Paribas. “Spatial is the only solution we want to use for meetings from now on,” said Florian Couret, BNP Paribas’ Head of Digital Innovation. “We use Spatial on Magic Leap for real estate development planning across several offices. Being able to review 3D information and feel like we’re actually in the room with colleagues helps us cut down on a lot of travel.”

Augmented reality can truly redefine what the traditional idea of a company “meeting” looks like. The concept of the Gemba walk is well established, and AR has obvious benefits for companies using this technique, something that communications giant Ericsson has been exploring using Magic Leap. Ericsson’s AR-enhanced Gemba walks show managers context-relevant overlays, pulling from back-end data on resource planning, equipment efficiency, analytics, and shop floor performance, as they walk around their smart factory. The headset even allows them to make and receive video calls on the move so that issues that are identified can be raised and shared in an instant.

AR training means upskilling staff faster

Traditionally, rolling out training programs for employees across a large company is time-consuming and often requires hiring specialist trainers and bringing them into multiple workplaces or sending staff out to external sessions. Either way, the cost and logistical requirements are steep. With AR learning, staff can be instantly connected to the best trainers in the world, across all your locations, and benefit from the same hands-on tuition wherever they are.

Magic Leap partner Talespin has not only been creating new immersive platforms to deliver AR training, but it has also conducted an in-depth study of the benefits of extended reality (XR) training solutions in conjunction with PwC. Among their key findings, they found that users of XR training picked up new skills 1.5 times faster than those using online e-learning and four times faster than those in a classroom environment. The same statistics also applied to learner focus;

those learning in AR/XR were four times more engaged than class-based learners and 1.5 times more focused than e-learning users.

Most importantly, the PwC study found that the ROI from XR staff training kicks in sooner than you might think. For companies looking to train just 375 staff members, using augmented reality can be cheaper than physical classroom learning. At 1,950 staff members, it becomes more cost-effective than e-learning.

AR is already addressing core business needs

It can be tempting to think of augmented reality as something only relevant to cutting-edge technology startups, but it already has the power to improve any company — particularly at the enterprise level — with practical improvements to essential processes. Those benefits won't only be felt in the C-suite either. One of the long-term advantages of wearable technology like AR is that it brings data and connectivity to deskless workers who have traditionally not had that access.

"I believe [AR] will be deeply integrated into the workflow processes of companies," said Peggy Johnson. "Frontline workers don't usually go back to a desk with a PC on it, and [AR] can be the PC for those workers. I think it will be very empowering for something like 3 billion frontline workers in the world today who don't have that kind of access and the tools that we take for granted."

There are already everyday uses of AR that are directly relevant to enterprise companies. Those who aren't investing in AR right now are not only missing out on immediate benefits, but they risk being left behind as the technology matures.

How One Airline Is Using AR to Improve Operations

14th April 2022

Safety 2.0

One of the first processes to benefit from CSA's embrace of the augmented reality is the safety inspection. (While the cause of the recent crash of a Boeing 737 operated by China Eastern Airlines is still being investigated, the incident underscores the importance of using any and all safety inspection tools available.)

After every landing of any passenger aircraft anywhere in the world, a maintenance, repair, and operations (MRO) engineer must perform a thorough aircraft inspection. An inspection on a Boeing 737 typically takes more than 100 steps, and an Airbus 320 takes more than 200 steps. This is a basic but crucial part of airline management, a pressing task that front-line MRO engineers must perform every day, often a number of times. CSA is no exception. As the world's third largest airline, the airline repeats this procedure over 2,500 times a day, a task that takes CSA's MRO engineers about 1,000 worker-hours.

In most of the world's airports, engineers check off each inspection item on a bulky, paper-based job card, a block of 20+ sheets of paper that they have to clutch throughout the entire task. Until recently, CSA's MRO engineers worked this way too, performing this work while juggling paper, pens, walkie-talkies, and the job card. But now, at 22 airports the CSA flies out of, most of the information, record-keeping, and communications tools are integrated into a single AR display. This display puts a whole range of resources at the engineers' service – not only text, but images, videos, graphs, and voice, in any combination that is helpful to the engineers.

While the AR glasses are expected to shave 6 percent off those 1,000 daily hours, we have found in our research on the integration of this technology at CSA that the advantages of the AR glasses go far beyond the labor dividend. They aren't just a new way to get information – they're a whole new way of working.

CSA's AR glasses allow engineers to edit and reorganize their job list, change the information they see, and how they want it shown. Their displays can be adjusted by aircraft, season, and even individual preference. They offer the engineers step-by-step multimedia support and immersive experiences during the execution of the tasks, including AI object recognition and collaboration with a remote expert.

"Combined with some [artificial intelligence], the AR glasses can really make our job a lot easier," one MRO engineer said. "I can now point my fingers to a place, for example, a lubricating oil cap, and it automatically recognizes the object or the key parts and tells me that it's open but should be closed. It also can show me, in a picture or a short video, how the object looked in normal condition or in its last service." When the task is done, engineers can even sign off using either voice or even gesture, if it's too noisy on the tarmac to use a voice command.

Rather than lug manuals big as unabridged dictionaries around or spend valuable time walking to an office to consult one, engineers can instantly access the information they need via the glasses. "I no longer have to go and look for the maintenance manual, which could take an hour walking back and forth. The manual is now coming to me, in front of my eyes!" one engineer told us. The AR glasses even make it possible for experts to advise mechanics on the tarmac in real time and supply them with pictures, videos, voice advice, and graphs.

The glasses also encourage more standardized performance. "It knows where I am in the process

and points me to where I need to go next. Everybody is following the same process in the same order," explained another engineer.

Welcome to the Augmented Operations

Wide-awake engineers, better compliance, a visual diary of the life of every component, and ultimately, safer flights are all benefits of this single pilot project in the 850-aircraft airline. The AR glasses optimize performance not only by bringing more knowledge closer to the machinery but by keeping MRO eyes on the prize. Like most earlier forms of digitalization, the CSA's experience suggests that augmented operations are less likely to supplant people than to augment their capabilities — a win for companies, employees, and travelers.

Today, the CSA's first augmented operational system is still a work in progress, not so much in its ability to transfer data to or from the individual — although that presents challenges – as in adapting the technology to meet the capacities of human cognition. The AR smart glasses need to comply to the industry's safety standards, as well as meeting important objectives for privacy, comfort, display, connectivity, ergonomics, battery lifetime, noise reduction, multi-media interactivity, immersive experience combined with transparency, required infrastructure (5G, edge computing), and a knowledge graph that can provide deeper AI-enabled support.

Only the beginning

And that's just one application in one industry — imagine the many other ways the technology might be used. Already, thousands of companies around the world are experimenting with various aspects of AR technologies. And we believe this number will rise dramatically once we understand more about the best ways to manage the user interface on all those smart glasses, and the awareness of this new and highly adaptable technology grows. It's not unlike the moment when something called a website appeared on our desktops or a decade later, when it became clear that apps were "the killer app" of the smart phone.

When the enterprise use of AR technologies has its own Netscape moment, we believe we will see many industries see the dawn of a massive new opportunity. Airlines, for instance, will be able to understand their cost structure in much more detail than they do now, down to the part. Ultimately, this cognitive shift could change the balance of power within the airline business, away from sales and the front office toward the back office and the maintenance hangar (particularly as the carbon footprint becomes more integrated into the price).

And this is only the beginning. As the CSA project has demonstrated, virtualization has no limits. Any person or object in airline operations, from mechanics to the airplanes or the entire airport — can be virtualized, given enough data and enough modeling. By creating a virtual representation of a physical object, plus an ongoing stream of new information about its status, digital twins of physical objects and even people can give airlines unprecedented ability to see how something is performing *right now* and simulate or predict how it *might* perform in the future.

CSA's success suggests that AR is finally becoming part of our working reality. But there are still many unanswered questions. In our work for CSA, for instance, we have been posing many questions about how to bring the best out of people. When do people need reminders? What are the signs that their attention is starting to flag? What's the most efficient way for mechanics to communicate through their glasses to an expert, who can walk them through a complex repair? At

the moment, the questions keep multiplying but, fortunately, so do the answers.

The Great Resignation in Manufacturing

14th April 2022

A recent article published by The Washington Post shows some shocking numbers on the amount of Americans leaving their jobs over the past year. It's no surprise that hotel and restaurant workers are resigning in high numbers due to the pandemic, but what is surprising is the fact that the manufacturing industry has been hit the hardest with "a nearly 60 percent jump" compared to pre-pandemic numbers. This "Great Resignation in Manufacturing" is the most of any industry, including hospitality, retail, and restaurants, which have seen about a 30% jump in resignations.

However, if you dig deeper, this trend isn't new. This recent increase in job quitting in manufacturing has simply magnified a problem that had already been brewing for years, even prior to the start of the pandemic. In fact, in the four years prior to the pandemic (2015-2019), the average tenure rate in manufacture had decreased by 20% (US Bureau of Labor Statistics).

This accelerating workforce crisis is placing increased pressure on manufacturers and creating significant operational problems. The sector that was already stressed with a tight labor market, rapidly retiring baby-boomer generation, and the growing skills gap is now facing an increasingly unpredictable and diverse workforce. The variability in the workforce is making it difficult, if not impossible to meet safety and quality standards, or productivity goals.

Manufacturing leaders' new normal consists of shorter tenures, an unpredictable workforce, and the struggle to fill an unprecedented number of jobs. These leaders in the manufacturing sector are facing this reality and looking for ways to adjust to their new normal of building a flexible, safe and appealing workforce. As a result, managers are being forced to rethink traditional onboarding and training processes. In fact, the entire "Hire to Retire" process needs to be re-imagined. It's not the same workforce that our grandfather's experienced, and it's time for a change.

The Augmented, Flexible Workforce of the Future

The reality is that this problem is not going away. The Great Resignation in manufacturing has created a permanent shift, and manufacturers must begin to think about adapting their hiring,

onboarding, and training processes to support the future workforce in manufacturing – an **Augmented, Flexible Workforce**.

What does this mean?

- It means adopting new software tools to support a more efficient “hire to retire” process to enable companies to operate in a more flexible and resilient manner.
- It means starting to understand your workforce at an individual level and using data to intelligently closes skills gaps at the moment of need and enables autonomous work.
- And it means taking advantage of data. More specifically, real-time workforce intelligence that can provide insights into training, guidance, and support needs.

Investing in AI-powered connected worker technology is one way to boost this operational resiliency. Many manufacturing companies are using digital Connected Worker technology and AI to transform how they hire, onboard, train, and deliver on-the-job guidance and support. AI-based connected worker software provides a data-driven approach that helps train, guide, and support today’s dynamic workforces by combining digital work instructions, remote collaboration, and advanced on-the-job training capabilities.

As workers become more connected, manufacturers have access to a new rich source of activity, execution, and tribal data, and with proper AI tools can gain insights into areas where the largest improvement opportunities exist. Artificial Intelligence lays a data-driven foundation for continuous improvement in the areas of performance support, training, and workforce development, setting the stage to address the needs of today’s constantly changing workforce. Today’s workers embrace change and expect technology, support and modern tools to help them do their jobs.

AR Smart Glasses: XR Today Expert Round Table with Qualcomm, Arvizio and Singulos Research

14th April 2022

One of the fastest-growing sectors in extended reality (XR) has inarguably become augmented reality (AR), which is used extensively among enterprises to conduct remote collaboration and inspections.

The AR industry has seen several crucial advancements in eye and hand tracking, gestures, deployment platforms, and greater interoperability for components and software, leading to huge developments for use cases and technological innovations.

As the Metaverse moves from 'virtual' reality to the next significant communications platform, combining spatial computing with the Internet, AR will become a key component of enterprise solutions.

For our XR Today round table, we are pleased to welcome:

- **Hugo Swart, Vice-President and General Manager of XR and Metaverse of Qualcomm Technologies**
- **Jonathan Reeves, Chief Executive and Founder of Arvizio**
- **Dr Brad Quinton, Chief Executive and CTO of Singulos Research**

Our esteemed panellists have discussed the role of their AR solutions in the greater XR market, ongoing trends shaping the industry, as well as their views on the future of the Metaverse.

XR Today: What sets your AR solution apart from the competition? What has your company considered when designing hardware and software solutions for devices?

Hugo Swart: Qualcomm has a unique role in enabling and supporting the entire ecosystem as a horizontal player, which sets us apart.

We deliver best-in-class system-on-a-chip (SoC) platforms that power over 50 XR devices and offer the software and perception algorithms needed to enable XR experiences. We also provide reference device hardware to allow our customers to go to market quickly and a lot of other ecosystem initiatives.

Hugo Swart, Vice-President and General Manager of XR

In terms of considerations when designing hardware, we work very closely with all of our partners to assess the end-user needs and build a platform that will meet and surpass those requirements.

On the software and developer ecosystem side, I would like to point to our Snapdragon Spaces XR Developer Platform born from Qualcomm's commitment to helping enable and scale head-worn AR, especially at the dawn of the Metaverse.

We wanted to help reduce developer friction and provide a uniform set of AR features independent of device manufacturers or distribution methods.

Jonathan Reeves: Arvizio is an AR software provider with solutions that operate across a range of AR devices, including mobile devices and AR smart glasses.

We believe the market requires a cross-platform approach for software solutions that can operate with a variety of smart glasses and mobile devices. This avoids scenarios where the customer is

locked into a single vendor for AR smart glasses.

Dr Brad Quinton: We deliberately designed the Perceptus Platform to support a diverse set of hardware platforms. From Android and iOS mobile phones and tablets to AR glasses, the Perceptus Platform can provide an understanding of objects in their 3D environment in a consistent framework for AR application developers.

Our key considerations were creating a scalable training process that allowed AR designers to quickly and easily define their objects of interest while also making sure our solution could run in real-time using only edge hardware, avoiding the need to transfer sensitive user data to the cloud.

XR Today: Which trends do you see taking shape in the AR sector, and which aspects of AR do you believe are more advanced and which are lagging?

Hugo Swart: A trend we see taking shape and would like to accelerate is the shift from smartphone AR to head-worn AR, which is the intent with Snapdragon Spaces.

The open ecosystem approach allows Snapdragon Spaces developers to build their head-worn AR experience once and have it scale to a range of devices and content distribution channels. Once Snapdragon Spaces becomes available to all developers, we think this will help spur a new trend and era of head-worn AR experiences spanning entertainment, gaming, education, training, health and beyond!

Jonathan Reeves: AR glasses typically fall into two key categories based on their ability to provide spatial mapping. Devices such as Microsoft's HoloLens 2 and Magic Leap can scan a room and use advanced simultaneous localization and Mapping (SLAM) algorithms to anchor AR content in place with a degree of accuracy.

This can apply in scenarios such as when the wearer moves their head, the content remains anchored in a fixed position. Other AR smart glasses lack spatial mapping and may not provide the degree of accuracy required for enterprise use cases.

Jonathan Reeves, Founder and Chief Executive of Arvizio

To date, achieving accurate spatial mapping has relied on depth-sensing cameras to build a 3D mesh of the space, much like LiDAR sensors in the iPhone Pro and iPad Pro have demonstrated.

To reduce the cost and weight of AR smart glasses, vendors are actively working on SLAM-based tracking approaches using stereoscopic cameras to deliver accurate tracking at a reduced cost.

This is challenging to achieve across a broad range of lighting conditions, but will lead to a significant reduction in cost, size, and weight.

A second key requirement for widespread adoption is hand gesture recognition. Devices such as HoloLens 2 have set the bar for this type of mixed reality (MR) interaction, and low-cost devices entering the market will need to offer a similar level of hands-free operation.

Dr Brad Quinton: The trends we see taking place in the AR sector are that many of the underlying AR hardware challenges are rapidly being resolved with maturing optics, high-speed wireless connectivity and high-quality virtual object rendering.

Where we see AR lagging is in the use of artificial intelligence (AI) to understand the context of the user's AR experience, to provide high-value, contextually aware experiences and applications.

All modern mobile processors have high-performance neural accelerators, but for the most part, they have yet to be deployed in a meaningful way for AR because of the lack of appropriate tools, platforms and software.

XR Today: Why is interoperability a key component of tailoring your AR solutions for multiple purposes? How has your company accommodated versatility for your clients, both for deployment and continued support?

Hugo Swart: There are many facets to interoperability and our chips are designed to interoperate with multiple display types and technologies, for example.

Another interoperability angle is the support for OpenXR, as we want to make it as frictionless as possible for developers to create immersive experiences. Snapdragon Spaces is also designed, leveraging existing developer tools, to create 3D content like Unity and Epic game engines.

Jonathan Reeves: Arvizio software solutions for AR have been designed to work across a variety of AR devices, including AR smart glasses and mobile devices.

We currently support HoloLens 2, Magic Leap, and iOS and Android devices, and expect to add additional devices supported by Qualcomm's Snapdragon Spaces initiative in the coming months.

Regarding the ongoing COVID-19 pandemic, remote collaboration has been a key driver in the use of AR and the crisis has made this necessary for business continuity.

Arvizio offers two solutions: the Immense 3D software solution and AR Instructor. Our Immerse 3D software allows multiple users to work with 3D models across locations for design reviews and stakeholder collaboration. Additionally, our AR Instructor offers step-by-step work instruction and remote expert "see-what-I-see" video sharing for additional guidance and work validation.

Dr Brad Quinton, Chief Executive and CTO of Singulos Research

Dr Brad Quinton: Interoperability is key for us because there is still no de-facto standard on AR hardware. We believe that it will be important to support a variety of hardware and operating systems in the near-to medium-term as users and application developers learn which hardware works best for them and their usage scenarios.

XR Today: What are your company's thoughts on the Metaverse? When do you expect a solid foundation for the platform, and what would it look like?

Hugo Swart: We truly believe in the potential of the Metaverse and that Qualcomm is your ticket to it. Qualcomm has been investing in the underlying and core technologies to enable the Metaverse for over a decade, and we will continue to do so to help all our partners build and realize its full potential.

We are enabling our customers' different Metaverse ecosystems and deploying our own with Snapdragon Spaces, so we believe the foundation is being built and something will come to fruition in the not-so-distant future.

Jonathan Reeves: We do not see a single Metaverse meeting the needs of all, but rather a set of Metaverse categories with several approaches being offered in each.

We believe four categories of Metaverse will emerge — Industrial, Business, Social, and Gaming — and in each category, there will be a variety of solutions and vendors, each vying for leadership. We believe this is a far more likely outcome than a single, dominant Metaverse platform.

Dr Brad Quinton: We believe that the Metaverse will be fundamentally personal and anchored in our own physical spaces. We see a continuity between AR and immersive VR, where users will select the minimum amount of immersion to achieve the task and experience they want, merging the value of the Metaverse with the comfort of physical reality.

Rather than having to pay the cost of immersion as an entry fee to the Metaverse, they will instead move through an AR-first Metaverse that transitions to immersive experiences when it makes sense.

We believe that mobile processors with advanced AI hardware coupled to 5G networks will be the platform for AR-first Metaverse in the next 1-3 years.

Development of an AR-based process management system The case of a natural gas power plant

14th April 2022

Since the beginning of the Industry 4.0 era, Augmented Reality (AR) has gained significant popularity. Especially in production industries, AR has proven itself as an innovative technology renovating traditional production activities, making operators more productive and helping companies to make savings in different expense items.

Despite these findings, its adoption rate is surprisingly low especially in production industries, due to various organizational and technical limitations. Various AR platforms have been proposed to eliminate this gap, however, there is still not a widely accepted framework for such a tool.

This research presents the reasons behind the low adoption rate of AR in production industries, and analyzes the existing AR frameworks. Based on the findings from these analyses and a conducted field study, a cloud-based AR framework, which provides tools for creating AR applications without any coding and features for managing, monitoring and improving industrial processes is proposed.

The design and development phases are presented together with the evaluation of the platform in a real-world industrial scenario.

This work was supported by the Scientific Research Unit (BAP) of Istanbul Technical University under Grant number MGA-2018-41553; the Scientific and Technological Research Council of Turkey (TUBITAK TEYDEB) under Grant number 7170742.

Readers can find out more by visiting the following link

Appearition Now Supports 5G Edge Powered by AWS Wavelength

14th April 2022

SmartConnect uses AWS Wavelength to help provide the capability to develop and scale digital solutions utilizing edge computing on 5G networks.

A headless, composable, application programming interface (API)-driven platform, Appearition enables enterprises to design and implement AR, VR, and XR applications without having to develop the backend architecture. It is device-agnostic, supporting all headset-mounted devices, or mobile devices using Web AR.

The platform serves as a low code solution for the development of a variety of AR, VR, and XR applications across multiple industry verticals such as retail, education, connected

workforce, tourism, and property development.

“5G networks, with their high bandwidth, speed, and low latency drive exciting new innovations and will be the catalysts of louder adoption of immersive technologies. Appearition is excited to leverage AWS Wavelength to help launch this exciting new solution that will enable enterprises and developers build digital solutions using edge technologies,” said Raji Sivakumar, Co-founder and Chief Operation Officer at Appearition.

Enterprises who are looking to create immersive experiences through AR, VR, or XR applications will now be able to do so faster, cost effectively, and at scale. SmartConnect allows Appearition users to take full advantage of the platform’s edge computing capabilities. This can significantly reduce the resource demand on headset hardware and enable enterprises to rapidly prototype AR/VR/XR concepts with the ability to launch software-as-a-service (SaaS)-based products quickly.

High intensity video and graphics processes that would typically require a considerable amount of CPU power from user devices can now be delegated to edge computing to do all the heavy lifting. This removes the limits that many AR/VR/XR applications face by being restricted to the minimal resources a headset can offer.

SmartConnect now allows applications to access more processing power and additional computational resources. This can help expand the capabilities of applications and remove any limits due to limited computing capabilities. It also improves and delivers consistent immersive experiences to end users, regardless of the type of devices.

The Price of Drugs: Exploring New Realities in Pharma

14th April 2022

In response, large, mainline biotech firms like Pfizer and Novartis, smaller CMOs (contract manufacturing organizations), equipment manufacturers and others involved in the highly fragmented pharmaceutical sector are looking to emerging technologies to improve efficiency, speed up research and production, widen margins, and guarantee quality and safety.

The author describes what it takes to develop a drug and changes in Pharma, then goes on to discuss immersive wearable tech in pharma:

If you can't raise prices, then you need to cut costs elsewhere. For pharma companies, this means spending less time and money on R&D and going to market faster. As the drug pipeline shifts to meet demand for personalized medicine (targeted biologics), pharma companies are feeling the pressure to revamp their product lines, factories, and processes to become more streamlined and cost-efficient.

AR/VR for drug discovery

R&D spending in pharma has been rising parallel to the growing complexity of drug development, leading forward-thinking companies to explore AR/VR as a tool for discovering new drugs faster (and therefore cheaper). If VR-trained surgeons are able to complete procedures faster than non-VR trained surgeons, it follows that pharma researchers would innovate faster with VR than they currently can using computer graphics (CAD) and static models of molecules made of wooden balls and wires. Indeed, whether in the classroom or the lab, virtual reality is proving effective for visualizing and conveying difficult concepts while augmented reality can put interactive complex molecules into the scientist's real-world environment.

Wearing a VR headset, drug developers can step inside a molecule or compound to see how it responds to different stimuli and quickly simulate complex drug interactions. Wearing AR smart glasses or a mixed reality headset, researchers can manipulate molecules and chemical structures in space – folding, knotting, and changing the shape of the molecules right before their eyes – and tweak a drug's chemical makeup so it bonds to the protein in question, altering its function to the desired effect. AR/VR decreases the number of errors in the years-long process of drug discovery, which is essentially one of trial and error, by helping "drug hunters" iterate and improve (get to the right shape) faster. As a result, companies are able to develop better drugs with fewer side effects. Immersive tech can also improve collaboration among researchers around the world, eliminating barriers like distance and language by allowing two or more scientists to walk through the same chemical structure together from separate locations.

For manufacturing

Training and education

In other manufacturing sectors, augmented and virtual reality are allowing new workers to learn on the job without making mistakes as well as safely practice operating equipment before using a real machine. Likewise, AR/VR can significantly improve training outcomes for pharmaceutical workers. In addition to "practice runs" on complex pharmaceutical manufacturing equipment even before entering a facility; a process engineer wearing safety smart glasses can learn on the job while still meeting high levels of control and quality by accessing step-by-step instructions and other multimedia support for troubleshooting and repairing a machine right in her field of view or connecting via livestream to a remote expert for guidance and support. Operators and scientists can also use VR to learn the proper principles of aseptic technique and the proper procedures for

different laboratory and production environments (ex. the specialized containment and personal protection requirements for HPAPIs). Beyond production, AR/VR can help explain new treatments to doctors and patients, and train nurses to administer a new drug or therapy.

Heads-up, hands-free information and documentation

In manufacturing in general, data from connected machines is unlocking the ability to perform predictive maintenance, saving manufacturers millions of dollars in downtime; so a systems engineer wearing smart glasses in a pharmaceutical plant could receive real-time, heads-up and hands-free notifications about, say, a location that will soon need replenishment or an instrument that's predicted to fail, allowing him to catch and address issues in advance, thereby improving efficiency, speeding up production, and lowering costs. Anywhere along the production cycle, digital information can be beamed in this way to augment an engineer's view and intuitively show him or her what to do. For instance, an engineer could use smart glasses to scan the QR code on a piece of equipment, automatically bringing up work instructions or an interactive diagram tailored to that machine. Engineers could access batch records heads-up and hands-free and record values and videos via voice command, never needing to take their hands or attention away from a process. This is also an easy and effective method for audit readiness.

Remote support

All of this instant, hands-free access to information – presented heads-up and in context – is designed to enable users to work faster and more accurately, but it's not just the challenges of visualizing complex drugs and the use of incorrect, out-of-date paper procedures, manuals, and documentation that slow down time to market; the need to fly in specialists to a pharmaceutical facility when something goes wrong is another contributor to what has become a years-long, complicated, error-prone and unrewarding process. Immediate ROI and time saved can be had from adopting AR glasses for remote support, especially when users need vendor advice. With augmented reality software, the expert can even draw on the user's display to highlight specific buttons or connections and drop 3D arrows into her real-world environment in the facility.

Conclusion

The possibilities for AR/VR in the pharmaceutical sector are great and desperately needed. Pharma companies should be taking cues from other advanced manufacturing sectors, which are already seeing results in training, efficiency, quality insurance, and safety through the use of AR glasses and VR headsets. Of course, pharma is a sensitive industry, and new devices open up new opportunities for hackers to gain patient data and secret drug research. Any investments in emerging technologies must be accompanied by investments in cybersecurity.

Using Augmented Reality To Teach Real

Construction

14th April 2022

Learning to make a dazzling technology practical

Augmented reality, or AR, is a way of adding digital elements to a live view, often by using the camera on a smartphone. While it's been available for years, it became popular with the creation of social media tools such as Snapchat filters and mobile device games like Pokemon Go.

On the other hand, virtual reality, or VR, is an experience that seeks to place an individual in an entirely virtual world. This immersion is typically accomplished through the use of VR goggles or a headset.

Ayer says he was first introduced to augmented and virtual reality as an undergraduate architectural engineering student at Pennsylvania State University. He was working as a lab assistant managing the equipment when he says his interest took off.

"I got very dazzled by them," says Ayer, who is a faculty member in the School of Sustainable Engineering and the Built Environment, one of the seven Fulton Schools.

Out of a desire to utilize AR and VR technologies, he says he found himself seeking problems that would fit the tools instead of the other way around, which made it difficult to measure the technologies' impact and success.

As he entered his master's degree program, also at Pennsylvania State University, Ayer says he had to reevaluate how he was looking at technology and the role it plays both in a classroom and in the real world.

"Through grad school, and certainly when I got to ASU, the shift was pretty polar opposite: Don't start with the technology, start with the human and the problem that the human has, and how that technology is supporting them," Ayer says.

This perspective is something he attributes to a subtle comment made to him during his doctoral studies by a mentor and co-adviser, Chimay Anumba, who is now at the University of Florida.

"In a very sort of understated way, I remember him just saying to me, 'Sometimes when you have a hammer, the whole world looks like a nail,'" Ayer says.

Addressing the problems

Over the years, Ayer has come to identify two major challenges AR and VR technology can help students face when it comes to construction education and entering the workplace.

The first is visualizing design concepts from two-dimensional plans that represent a three-dimensional space.

“We take this 3D concept; we have this building around us. And the way we communicate that is we dumb it down to flat paper plans,” Ayer says. “Instead, we can give them augmented reality glasses with the idea of saying, let’s make it easy to understand the design. They just see the model show up almost like it was there, but it’s virtual.”

Ayer says once students can get past the dazzled phase, they can dial in and learn the underlying construction competencies they need to be successful on the job.

For example, Ayer says he conducted a study a few years ago aimed at helping students explore buildings as if they were the end-users, like a facilities manager tasked with keeping a building up and running. He says they gave one group of students an augmented reality setup and the other group a computer setup. Both were given the same task of exploring the building to find flaws in the design. He says both groups could identify the flaws, but the group utilizing AR was able to come up with ways to improve the design and correct the flaws.

“The students using the computer setup, which was still a 3D model on the screen, knew something had to be considered, but couldn’t effectively articulate what about the design was problematic,” Ayer says.

Kieren McCord, a construction management doctoral student in the Fulton Schools, says while doing research with Ayer for her dissertation, she was inspired by the use of AR and the ability it gives students to visualize designs.

“Physical builds are a great way to learn, but they can be extremely cost-prohibitive to bring to a classroom. So, a virtual simulation can be a valuable, cost-effective alternative,” McCord says.

She says there are far fewer physical restraints on virtual environments, meaning if you can dream it, you can create it in a virtual environment.

The second challenge Ayer says he wants to improve is job site safety.

What makes people change behavior is when they see or experience a bad thing.

— Steven Ayer, associate professor of constuction engineering

“We see a lot of times where we use very antiquated modes of teaching safety courses that are ‘chalk-and-talk’ lecture-style learning, which by almost any accounts have been ineffective, and, by empirical data on sites, still don’t stop injuries,” Ayer says.

“People from industry will say, ‘I didn’t care about safety until …’ and they’ll tell you a story of when they saw someone hurt, or someone lost a life,” he says. “And when they’re the one that makes the phone call to the husband or wife saying, ‘Your spouse isn’t coming home today,’ it hits

them.”

With that impactful moment in mind, Ayer says he sought to create an experience for students that balanced real-life decisions with the dangerous outcomes created by mistakes.

“What makes people change behavior is when they see or experience a bad thing,” Ayer says. “What we’re doing with virtual reality is putting students and even industry personnel into this environment. But, unlike most virtual reality training environments that give a report card when something goes unrecognized and they fail to identify the hazard, we will show them the impact of their decision.”

Ayer says showing the impact is accomplished through the use of slow-motion video or animations. In addition, the negative effects never impact the AR user, but another character within the virtual environment.

“The situation would be to see if we can have a virtual artificial stimulus, the VR experience, trigger a real psychological response,” Ayer says. “So, now students or industry professionals can say, ‘I didn’t care about safety until I had this really impactful training experience that didn’t actually harm anyone.’”

He says the biggest challenge is overcoming how students and industry professionals first react when they experience these technologies. Many people find it “cool,” he says, but this impression isn’t what he wants to see.

“What are the metrics you would track to know if this provided a return on investment, or saved lives, or reduce rework, or whatever the underlying value is? How we get them back to thinking about that can be a challenge,” Ayer says.

It’s a challenge that he’s willing to take on because he says technology is something that education and industry need to take seriously, as it can be the solution to several problems, not only in construction, but in society as a whole.

“I think in the future, as technology becomes more prevalent, the role the human plays may be more critical because we will be slightly more out of the loop in terms of decision-making tasks and that kind of thing,” Ayer says. “So getting the human to interact with those technologies really well, for the time that they do, will be even more critical.”

How is Augmented Reality used in the Construction Industry?

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R&D expenses in the construction industry are often substantially lower than those in other industries (it rarely goes higher than 1 percent of revenues). That might be another reason why it is losing ground in the digital age and lagging behind other industries in terms of integrating innovative technology.

According to MIT Technology Review, employing advancements in the field of augmented reality is one approach for the construction sector to enhance production quickly while ensuring long-term effects (AR).

Augmented Reality is a technology that augments actual environments on a mobile device screen by superimposing digital material on top of them. Augmented Reality is built on real-world footprints and simply adds computer-generated data such as animation or three-dimensional objects to it rather than completely replacing any virtual experience.

Augmented Reality in Construction

Because of its capacity to give real-time information, augmented reality is being used in the construction sector to increase productivity, improve safety on building sites, maximize teamwork and collaboration, and time management, cost, and supplies.

There are many sub-processes in Construction where Augmented reality is of utmost importance. Some may be associated with Project planning whereas some may be associated with construction training. Whatever it may be, we'll be discussing every plausible steps in construction that requires AR.

Additionally Augmented reality is one of the most promising technologies of Industry revolution 4.0. So, it's important that we leverage the most important technology across every field so as to stay ahead.

The article then goes on to cover some of the processes in construction that require AR for better implementation. These are repeated below only in bullet point form. Readers may want to visit the article in full for an in depth explanation.

1. Planning of Projects
2. Team Efforts
3. Information of Projects
4. Training of Safety and Precaution

5. Measurement

The article then goes on to explore:

- Restrictions of Augmented Reality in Construction
- Successful Implementation of AR in Construction
- Future of Augmented Reality in Construction