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UNIÓN EUROPEA

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MAIN GAP

REALIDAD AUMENTADA Y VIRTUAL.

BOLETÍN DE VIGILANCIA TECNOLÓGICA

ENERO-MARZO 2021

AXENCIA GALEGA DE INNOVACIÓN – CIS TECNOLOXÍA E DESEÑO



XUNTA
DE GALICIA



CEIIA



Universidade do Minho



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NOTICIAS

7/01/2021

Realidad virtual o doctor a bordo: así serán los coches del futuro con Grupo Antolin

Imágenes del exterior proyectadas en el techo, iluminación dinámica, realidad virtual en el salpicadero o la consola central, funciones de monitorización, sistemas de protección frente a epidemias, superficies táctiles inteligentes, botones ocultos hasta que se encienden y hasta información en tiempo real sobre la salud del conductor y los pasajeros. Así serán los coches del futuro gracias al Concept Car Virtual, la visión del Grupo Antolin sobre el interior del automóvil.



<https://www.marca.com/coches-y-motos/accesorios/2021/01/07/5ff72728e2704eb84f8b45f0.html>

8/01/2021

Audi fabrica el e-tron GT sin haber utilizado prototipos físicos

El Audi e-tron GT es el primer modelo de este constructor en globado en el Grupo Volkswagen, cuya producción se ha planificado íntegramente sin prototipos físicos. Fuentes del fabricante subrayan que múltiples innovaciones técnicas lo han hecho posible, incluyendo escaneos tridimensionales de edificios, procesos de aprendizaje de máquina y el uso de la realidad virtual (RV). Todos los procesos de montaje, al igual que los procedimientos y las acciones de los operarios, se probaron y optimizaron en espacios virtuales que replican a sus homólogos del mundo real hasta el más mínimo detalle.



<https://www.auto-revista.com/texto-diario/mostrar/2254105/audi-fabrica-e-tron-gt-haber-utilizado-prototipos-fisicos>



10/01/2021

Las nuevas gafas de realidad aumentada de Lenovo muestran hasta 5 monitores virtuales con Windows 10 a la vez

Lenovo ThinkReality A3 son las gafas de realidad aumentadas más ligeras y avanzadas para las empresas, según asegura la nota de prensa. Curiosamente, pese a que integra el procesador Qualcomm Snapdragon XR1, el mismo que permite a las Oculus Quest 2 funcionar de forma autónoma sin necesidad de PC o móvil, las gafas de Lenovo sí tendrán que conectarse obligatoriamente a un móvil Motorola, o a un PC. Y parece que cada dispositivo tendrá su propia versión.

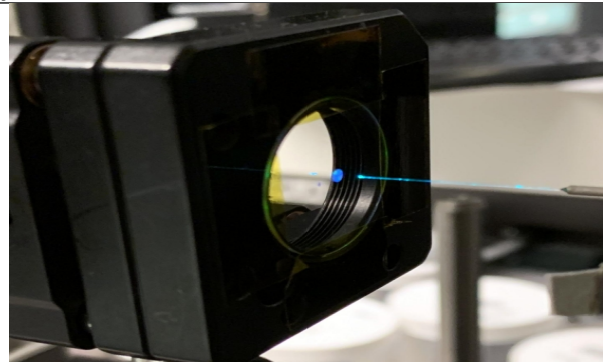


<https://computerhoy.com/noticias/tecnologia/Lenovo-ThinkReality-A3-gafas-realidad-aumentada-788133>

27/01/2021

A metalens for virtual and augmented reality

At the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS), a team of researchers led by Federico Capasso, the Robert L. Wallace Professor of Applied Physics and Vinton Hayes Senior Research Fellow in Electrical Engineering, has been developing the next generation of lenses that promise to open that bottleneck by replacing bulky curved lenses with a simple, flat surface that uses nanostructures to focus light.

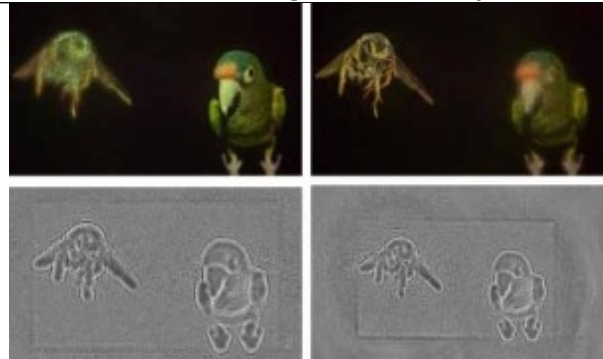


https://www.eurekalert.org/pub_releases/2021-01/hjap-amf012721.php

28/01/2021

Improvements to Holographic Displays May Enhance Virtual and Augmented Reality

In Optica, The Optical Society's (OSA) journal for high impact research, the researchers describe their new holography display technology called Michelson holography. The approach combines a new optical setup inspired by Michelson interferometry with a recent software development. The setup generates the interference patterns necessary for making digital holograms.



https://www.novuslight.com/improvements-to-holographic-displays-may-enhance-virtual-and-augmented-reality_N11251.html



4/02/2021

Llegan nuevos datos sobre el primer dispositivo de Realidad Virtual de Apple

Poco a poco van llegando nuevas informaciones acerca del desarrollo de los dispositivos de Realidad Virtual y Realidad Aumentada en los que Apple lleva tiempo trabajando, sabiendo a estas alturas que el primero de ellos tiene prevista su llegada para el próximo año, aunque no irá dirigido a un público masivo, aunque sí el que lanzarán en 2023, y tendrá un precio bastante elevado en relación a los dispositivos de Realidad Virtual de la competencia, según nos hizo saber Bloomberg en su informe del pasado mes de enero.

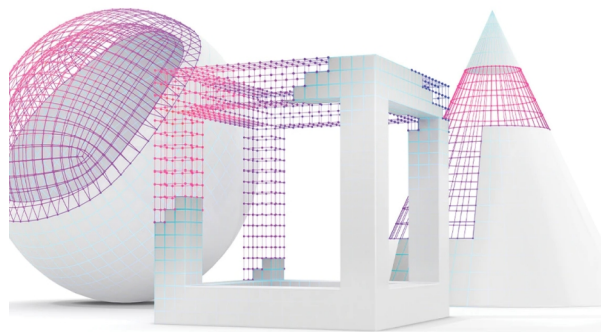


<https://www.whatsnew.com/2021/02/04/llegan-nuevos-datos-sobre-el-primer-dispositivo-de-realidad-virtual-de-apple/>

8/02/2021

How Augmented Reality Became a Serious Tool for Manufacturing

Augmented reality (AR) is not just about fun and games. "It also has a variety of uses in industrial automation," notes Eran Nadel, director of innovation projects and rapid development manager for manufacturing engineering at Siemens Digital Industries Software. He should know because he and his colleagues are among the select group of engineers who have been developing AR technology for use in manufacturing. These engineers have been superimposing virtual elements constructed from CAD and other data onto views of real objects depicted on mobile devices, desktop computers, smart glasses, and headsets.



<https://www.automationworld.com/process/iiot/article/21259479/how-augmented-reality-became-a-serious-tool-for-manufacturing>

22/02/2021

Samsung Glasses Lite y Glasses AR: así imagina Samsung las gafas de realidad aumentada en dos vídeos filtrados

Samsung anunció el cierre de sus servicios de realidad virtual el año pasado, dejando sin soporte a sus gafas de realidad virtual. Según unos vídeos filtrados, puede que no sea el fin del camino para la realidad virtual y aumentada en Samsung, dejando al descubierto dos modelos conceptuales de gafas de realidad aumentada.

Bajo el nombre de Samsung Glasses Lite y Samsung AR Glasses, tenemos dos gafas de realidad aumentada con las que se podría consultar contenido, jugar a juegos, asistir a reuniones virtuales holográficas y otros escenarios similares.

<https://www.xatakandroid.com/gadgets-android/samsung-glasses-lite-glasses-ar-asi-imagina-samsung-gafas-realidad-aumentada-dos-videos-filtrados>



24/02/2021

El 5G transformará la fábrica de Ford en Valencia aplicando la innovación industrial al sector de la automoción

El 5G transformará la fábrica de Ford en Almusafes (Valencia) aplicando la innovación industrial al sector de la automoción. En esta planta se implementará y se validará la tecnología 5G más avanzada y las innovaciones más recientes en robótica móvil, realidad virtual e inteligencia artificial con el apoyo del proyecto H2020 5G- Induce de la Unión Europea.



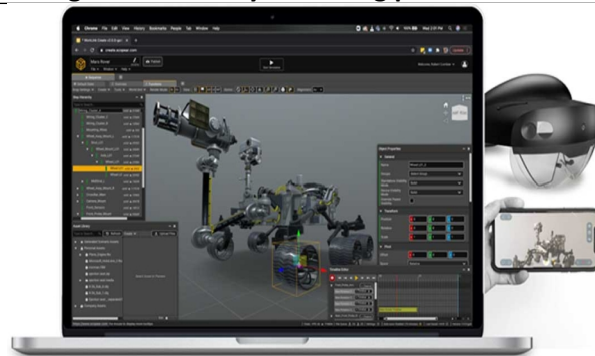
<https://www.automaticaeinstrumentacion.com/texto-diario/mostrar/2733838/5g-transformara-fabrica-ford-valencia-aplicando-innovacion-industrial-sector-automocion>

24/02/2021

Scope AR launches WorkLink Create enterprise augmented reality authoring platform

Scope AR, an enterprise-class augmented reality solution provider, today announced the launch of WorkLink Create, a new web-based application for quickly creating and sharing AR content within the workplace.

WorkLink Create will allow aerospace, medical device and industrial professionals to quickly prototype their own augmented reality content without coding knowledge or 3D modeling experience. That's intended to lower barriers and expand the audience for creators and open up whole new horizons and opportunities for the use of AR across these industries.



<https://siliconangle.com/2021/02/24/scope-ar-launches-worklink-create-enterprise-augmented-reality-authoring-platform/>

5/03/2021

Smart Glasses Designed to Deliver High-Quality AR Experience

Epson has announced the Moverio BT-40 and BT-40S new generation of augmented reality (AR) smart glasses designed to deliver a high-quality AR viewing experience with maximum comfort. Powered by Epson Si-OLED technology, the new Moverio solutions offer users a number of advances including a wider field of view (FOV), Full HD 1080p display resolution, high contrast, improved connectivity, and a more comfortable, adjustable and easy-to-wear design.



<https://metrology.news/smart-glasses-designed-to-deliver-high-quality-ar-experience/>



9/03/2021

Unity Acquires Augmented Reality Construction Platform, VisualLive

Unity (NYSE: U), the world's leading platform for creating and operating real-time 3D (RT3D) content, today announced the acquisition of VisualLive, a technology company enabling the architecture, engineering, and construction (AEC) industry to reduce costs and increase efficiency by visualizing and collaborating in augmented reality (AR). VisualLive's technology is complementary to Unity Reflect, the immersive collaboration and development platform that connects people, project stages, and data across the digital building lifecycle. This acquisition expands Unity's strategic growth in the AEC industry and allows customers to achieve optimal efficiency and cost-savings.

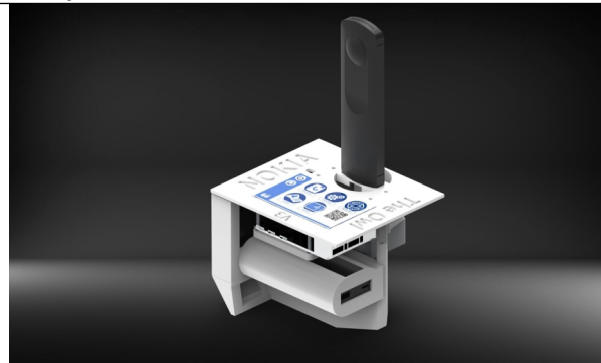
<https://finance.yahoo.com/news/unity-acquires-augmented-reality-construction-170000357.html>

24/03/2021

Reuniones a distancia como si estuvieses en la oficina con una cámara 360º y realidad virtual: la gran apuesta de Nokia para el teletrabajo

Nokia quiere llevar las videollamadas al siguiente nivel. La compañía finlandesa está desarrollando en España, a través del laboratorio Bell Labs, un sistema de comunicación inmersiva con el que el usuario puede sentir que está en el lugar físico al que está llamando gracias a la combinación de un dispositivo con cámaras de 360º y unas gafas de realidad virtual.

Este dispositivo, denominado The Owl, retransmite un vídeo en 360º y en directo y lo envía, mediante redes 5G, a las gafas de realidad virtual del usuario en remoto, las cuales, gracias a la tecnología VR, reproducen el espacio físico en 3D para la persona que las esté usando.



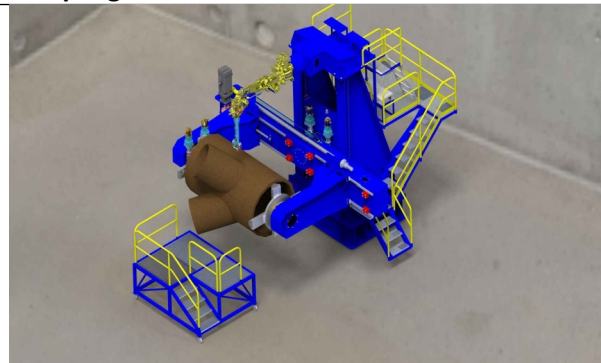
<https://www.xataka.com/pro/reuniones-a-distancia-como-estuvieses-oficina-camara-3d-realidad-virtual-gran-apuesta-nokia-para-teletrabajo>

24/03/2021

El astillero 4.0 de Galicia toma impulso con el despliegue de una red 5G exclusiva

Navantia y Telefónica se alían para modernizar los procesos de reparación y construcción de buques. Entre los avances, la asistencia técnica remota.

El 5G permitirá la asistencia técnica remota mediante realidad aumentada y modelos 3D para diagnóstico y soporte. Hasta ahora cada vez que se avería una pieza importante era necesaria la presencia 'in situ' de un especialista, lo que provocaba días de interrupción con la consiguiente pérdida de competitividad.



https://www.elespanol.com/invertia/disruptores-innovadores/autonomias/galicia/20210324/astillero-galicia-toma-impulso-despliegue-red-exclusiva/566694276_0.html



31/03/2021

PTC announces 'Area Targets' addition to its Vuforia platform for AR experiences for spaces up to 300,000 sq ft

PTC, a provider of digital solutions for industry and manufacturing, has this week announced the newest addition to its Vuforia enterprise augmented reality (AR) platform with the introduction of its 'Vuforia Engine Area Targets' offering. According to the company, the new offering supports the creation of immersive AR experiences for spaces up to 300,000 square feet (the equivalent of six American football fields).

Through the use of Area Targets, industrial organizations can create AR interfaces within their facilities to enable employees to better engage with machinery and understand how an environment is being utilized.



<https://www.auganix.org/ptc-announces-area-targets-addition-to-its-vuforia-platform-for-ar-experiences-for-spaces-up-to-300000-sq-ft/>



PUBLICACIONES CIENTÍFICAS

ENERO

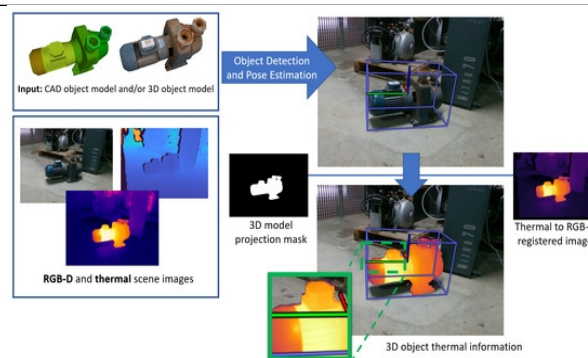
Conceptualising touch in VR

How touch is conceptualised matters in shaping technical advancements, bringing opportunities and challenges for development and design and raising questions for how touch experience is reconfigured. This paper explores the notion of touch in virtual reality (VR). Specifically, it identifies how touch ‘connection’ is realised and conceptualised in virtual spaces in order to explore how digital remediation of touch in VR shapes the sociality of touch experiences and touch practices. Ten participants from industry and academia with an interest in touch in virtual contexts were interviewed using an in-depth semi-structured approach to elicit experiences and perspectives around the role of touch in VR. Data analysis shows the growing value and significance of touch in virtual spaces and reveals particular ways in which touch is talked about, implemented and conceptualised.

<https://link.springer.com/article/10.1007/s10055-020-00494-y>

MANTRA: An Effective System Based on Augmented Reality and Infrared Thermography for Industrial Maintenance

In recent years, the benefits of both Augmented Reality (AR) technology and infrared thermography (IRT) have been demonstrated in the industrial maintenance sector, allowing maintenance operations to be carried out in a safer, faster, and more efficient manner. However, there still exists no solution that optimally combines both technologies. In this work, we propose a new AR system—MANTRA—with specific application to industrial maintenance. The system can automatically align virtual information and temperature on any 3D object, in real time.



<https://www.mdpi.com/2076-3417/11/1/385>



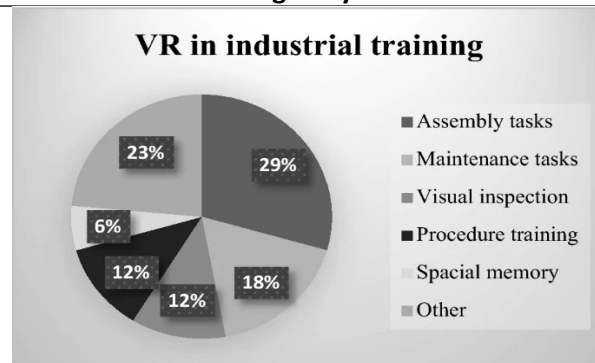
Exploring gestural input for engineering surveys of real-life structures in virtual reality using photogrammetric 3D models

Photogrammetry is a promising set of methods for generating photorealistic 3D models of physical objects and structures. Such methods may rely solely on camera-captured photographs or include additional sensor data. Digital twins are digital replicas of physical objects and structures. Photogrammetry is an opportune approach for generating 3D models for the purpose of preparing digital twins. At a sufficiently high level of quality, digital twins provide effective archival representations of physical objects and structures and become effective substitutes for engineering inspections and surveying. While photogrammetric techniques are well-established, insights about effective methods for interacting with such models in virtual reality remain underexplored. We report the results of a qualitative engineering case study in which we asked six domain experts to carry out engineering measurement tasks in an immersive environment using bimanual gestural input coupled with gaze-tracking.

<https://link.springer.com/article/10.1007/s11042-021-10520-z>

Effectiveness of VR Head Mounted Displays in Professional Training: A Systematic Review

Over the past decade, virtual reality (VR) has re-emerged as a popular technology trend. This is mainly due to the recent investments from technology companies that are improving VR systems while increasing consumer access and interest. Amongst many applications of VR, one area that is particularly promising is for pedagogy. The immersive, experiential learning offered by VR provides new training and learning opportunities driven by the latest versions of affordable, highly immersive and easy to use head mounted display (HMD) systems.



<https://link.springer.com/article/10.1007/s10758-020-09489-9>



FEBRERO

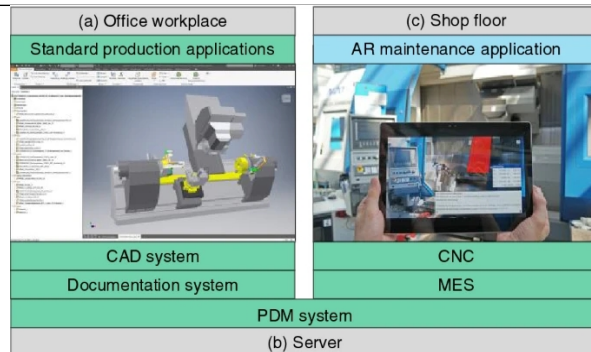
Seven Levels of Detail to structure use cases and interaction mechanism for the development of industrial Virtual Reality applications within the context of planning and configuration of robot-based automation solutions

The term Virtual Reality (VR), is very well known in the consumer goods and entertainment sector. The visual presentation of the VR environment is typically achieved via stereoscopic head-mounted displays (HMD), and the interaction via a 3D position detection of HMD and additional input devices such as controllers for active user input. While the variety of applications in the entertainment industry is constantly growing and the technological possibilities become more extensive, this trend has marginally established itself in the industry. Even though powerful and affordable VR hardware is available, VR applications are often associated more with gaming than professional industrial applications. In addition, only few interaction mechanisms such as 3D viewing, moving, teleporting and rarely direct interaction capabilities are used in the most industrial VR solutions. The reason for this is often a lack of understanding and structure of use cases and the added value that VR applications and interactions create for companies and their customers. This unnecessarily limits the applicability of new VR applications for the industry. For a better structuring of VR use cases and required 3D objects for targeted user interaction, we introduce seven Levels of Detail.

<https://www.sciencedirect.com/science/article/pii/S2212827121001165>

Efficient integration process of production data into Augmented Reality based maintenance of machine tools

With the increasing requirements on machine tools such as higher complexity, individuality and digitization, their maintenance becomes also more complex, which increases time consumption and demands special knowledge. The maintenance engineer can be supported in this process using the Augmented Reality (AR) technology, mobile devices and suitable production data. This requires the integration and adaptation of the maintenance documentation as well as further production systems and their data such as the CAD system, product data management (PDM) system, manufacturing execution system (MES) and CNC



<https://link.springer.com/article/10.1007/s11740-021-01026-6>



shARe-IT: Ad hoc Remote Troubleshooting through Augmented Reality

Problems arise in many situations in life. Sometimes we cannot solely resolve these problems on our own, prompting us to ask for assistance from people with a more comprehensive or technical expertise (Crabtree et al. 2006; O’Neill et al. 2005). Whether the problems pertain to bug tracking within software support centres (McDonald and Ackerman 1998), customers’ troubleshooting issues with their office devices (Castellani et al. 2009), medical diagnosis within hospitals (Cicourel 1990), or situation assessment within crisis control rooms (Ley et al. 2014), we often encounter practical troubles that simply exceed our own capacity.

<https://link.springer.com/article/10.1007/s10606-021-09393-5>

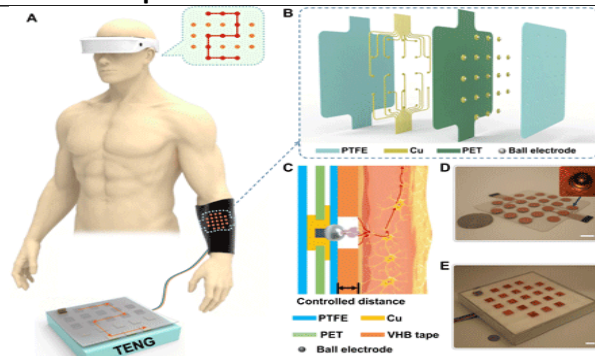
Review on existing VR/AR solutions in human–robot collaboration

During the last decades, there has been wide interest towards creating more agile and reconfigurable automation systems. This includes the research interest towards human–robot collaboration (HRC) solutions, where semi or fully automated process could be combined with human dexterity and flexibility without complexity and inflexibility. However, the communication between the human and the robot is not intuitive, fast or flexible yet. The emerging technologies such as Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (XR) are seen as good solution candidates for increasing the communication between human and the machine during the design, commission and operation phases. The design of the HRC system includes layout design evaluation, task scenario analysis, robot programming, cycle time calculations, and safety analysis. Virtual Reality and Augmented Reality technologies provide immersive experiences to visualize and analyze these procedures.

<https://www.sciencedirect.com/science/article/pii/S2212827120314815>

Self-powered electro-tactile system for virtual tactile experiences

Tactile sensation plays important roles in virtual reality and augmented reality systems. Here, a self-powered, painless, and highly sensitive electro-tactile (ET) system for achieving virtual tactile experiences is proposed on the basis of triboelectric nanogenerator (TENG) and ET interface formed of ball-shaped electrode array. Electrostatic discharge triggered by TENG can induce notable ET stimulation, while controlled distance between the ET electrodes and human skin can regulate the induced discharge current.



<https://advances.sciencemag.org/content/7/6/eabe2943>



Using Mixed Reality in Intralogistics - Are we ready yet?

The Industry 4.0 vision proposes a seamless integration of several modern concepts and technologies, such as the Internet of Things (IoT), artificial intelligence, or robotics, to capture and contextualize data to improve the manufacturing processes. In this respect, Industry 4.0 is all about information and connectivity. Mixed reality (MR) takes the data collected by IoT systems and helps workers by visualizing contextualized data in real time. Human-Computer Interaction research has shown that MR can be advantageous in various application scenarios. However, there is a gap between research and practice when it comes to real world scenarios. So the question arises whether MR is already suitable for efficiently supporting employees in their daily work in industrial settings. To answer this question, we examined two maintenance scenarios in the field of intralogistics: (i) the maintenance of roller conveyors and (ii) the alignments of containers in shuttle warehouses using the Microsoft HoloLens.

<https://www.sciencedirect.com/science/article/pii/S1877050921001745>

MARZO

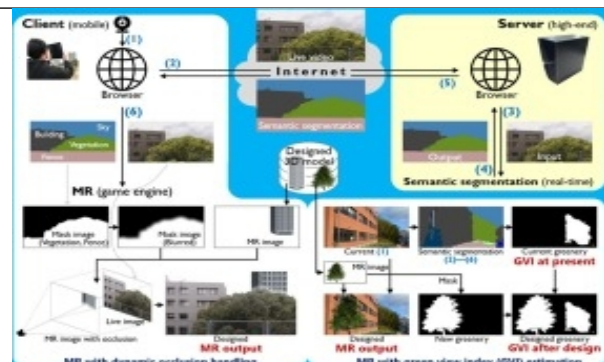
The Augmented Reality Technology as Enabler for the Digitization of Industrial Business Processes: Case Studies

Augmented Reality Technology Augmented Reality Technology (AR) is one of the key technologies of digital transformation in industrial and non-industrial areas. Due to the rapid development of display hardware and tracking systems, virtual and augmented reality applications are being developed today that would only have been possible in large research laboratories with huge efforts a few years ago. This paper presents the application of the augmented reality technology in the industrial field. Based on industrial case studies the implementation of two AR applications and their potential to digitize the product lifecycle processes will be discussed. The case studies were developed within cooperation projects between the University of Applied Sciences Karlsruhe and a fire truck manufacturer with the focus on the following topics: product configuration management and assembly assistance

<https://www.sciencedirect.com/science/article/pii/S2212827121001542>

Assessing future landscapes using enhanced mixed reality with semantic segmentation by deep learning

Architecture, engineering, and construction projects need to be promoted in harmony with the natural environment and with the aim of preserving people's living environment. At the planning and design stage, decision-makers and stakeholders share and assess landscape images during and after construction in order to avoid as much uncertainty as possible when performing environmental impact assessment.



<https://www.sciencedirect.com/science/article/pii/S1474034621000367>



EVENTOS

1 JUNIO 2021 BARCELONA - FIRA

XR Summit ISE 2021

XR Summit explores the latest XR business strategies, technologies, and solutions that are reshaping the audiovisual sector. The half-day event will feature thought leadership from some of the world's leading XR experts in roundtable discussions and presentations while offering valuable market insights and case studies.

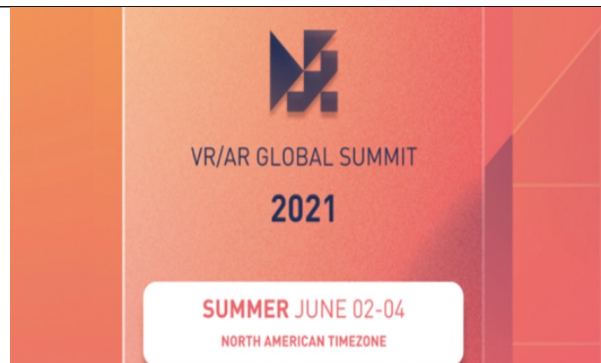


<https://xr-summit.org/about-2/>

2-4 JUNIO 2021

VR/AR Global Summit 2021 – North America

The VR/AR Global Summit is an online conference hosted that connects the best virtual reality and augmented reality solution providers with enterprise and media entertainment companies. Last year's edition attracted more than 15,000+ attendees, 500+ speakers, exhibitors, plus 1000s interactive 1-on-1s, 60 networking group sessions on specific topics/verticals, and so much more! The VRARA will be hosting two 2021 events – the North American Time Zone event on June 2-4 and a European Time Zone event from September 29 – October 1. This will be a great year of VR and AR content for the world.



<https://hopin.com/events/vr-ar-global-summit-2021-north-america>



7 JUNIO 2021

AR & VR WORLD SUMMIT | TECHXLR8 EUROPE

TECHXLR8 is the flagship event of London Tech Week where 17,000+ attendees, 4,500+ enterprises, 600+ keynote speakers, and 300+ exhibitors from over 95 countries across the world come together to share new ideas and solutions in the XR for enterprise space. During this event, there will be an in-depth discussion on all upcoming XR trends in business for the year ahead, plus a first-hand look at the latest technologies set to transform the enterprise landscape in 2021 and beyond.

<https://tmt.knect365.com/techxlr8/>



8-10 JUNIO 2021 BARCELONA - CCIB

ADVANCED FACTORIES 2021

Advanced Factories presenta en su edición 2021 el futuro de la industria. La Expo & Congress de referencia para los profesionales del sector manufacturero se consolida en su 5ª edición como el futuro de la automatización industrial. Un año más, Barcelona acoge en nuestro showroom a las empresas más innovadoras en automatización, robótica, máquina-herramienta y digital manufacturing, junto con todas las empresas tecnológicas especializadas en IoT o Inteligencia Artificial que están impulsando la mejora de la competitividad industrial, nuevos modelos de negocio, nuevos procesos de producción "on demand" y la customización del producto que impulsa una nueva experiencia de cliente.

<https://www.advancedfactories.com/>



28 JUNIO 2021 – 1 JULIO 2021

MOBILE WORLD CONGRESS Barcelona

The world's biggest connectivity event goes fully hybrid. This year you can connect in-person or online. From technicians and regulators, to founders and government delegations – whether it's with a click of a button, a smile on screen, a friendly elbow bump, or a knowing nod, 2021 offers even more ways to seal that deal with the most influential attendees.

<https://www.mwcbarcelona.com/>



05 – 07 OCTUBRE 2021

IOT SOLUTIONS WORLD CONGRESS

The 2021 edition will take place October 5-7 and it will be focused on disruptive combinations of technologies including IoT, AI, 5G, Digital Twin, Robotics and quantum computing. The new edition will combine an exclusive face-to-face exhibition aimed at C-Level executives with additional digital content for a broader worldwide audience.

<https://www.iotsworldcongress.com/>

