



Interreg
España - Portugal



Fondo Europeo de Desarrollo Regional



MAIN GAP

REALIDAD AUMENTADA Y VIRTUAL.

BOLETÍN DE VIGILANCIA TECNOLÓGICA.

ABRIL-JUNIO 2020.

AXENCIA GALEGA DE INNOVACIÓN – CIS TECNOLOXÍA E DESEÑO



**XUNTA
DE GALICIA**



CEIIA



Universidade do Minho



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NOTICIAS

1/04/2020

Augmented Reality Delivers Support to Industrial Companies During Coronavirus Crisis

In the industry, some tasks still need to be performed on site, especially maintenance tasks and safety checks. The challenge now is that less employees working in the field means less skilled workers available on site. Yet, the needed tasks still require the same level of expertise.

This is when augmented reality reveals its full potential. AR allows a skilled, off-site technician to remotely assist a worker in the field to perform a task. How? Thanks to a phone or a tablet and a remote assistance application. While at a distance, the remote expert can see what the field technician sees and can then assist him or her.

<http://emag.directindustry.com/augmented-reality-delivers-support-to-industrial-companies-during-coronavirus-crisis/>



28/04/2020

New device simulates feel of walls, solid objects in virtual reality

Today's virtual reality systems can create immersive visual experiences, but seldom do they enable users to feel anything -- particularly walls, appliances and furniture. A new device developed at Carnegie Mellon University, however, uses multiple strings attached to the hand and fingers to simulate the feel of obstacles and heavy objects.

By locking the strings when the user's hand is near a virtual wall, for instance, the device simulates the sense of touching the wall. Similarly, the string mechanism enables people to feel the contours of a virtual sculpture, sense resistance when they push on a piece of furniture or even give a high five to a virtual character.

<https://www.sciencedaily.com/releases/2020/04/200428084655.htm>

28/04/2020

AR and VR should be booming. So why aren't we interested?

The COVID-19 virus is forcing entire populations to stay confined at home, forcing them to find new ways to work and socialize. Seen through the eyes (or rather, lens) of companies that produce headsets and software designed to allow users to be transported to someplace else, for augmented reality (AR) and virtual reality (VR) companies the social distancing required by the coronavirus sounds more like an opportunity to show what they can do to help, than a looming threat to their businesses.

Certainly, many players in the mixed reality space are already jumping in to offer their services. In the UK, software company PTC is using Microsoft's HoloLens to offer training content in factories, so that producers can fast-track the learning process to build ventilators for the NHS. PTC's program, called Vuforia Expert Capture, lets experts record a task as they carry it out through a wearable device, before turning said task into a step-by-step video with voice instructions for other workers to copy via an AR headset.

<https://www.zdnet.com/article/ar-and-vr-now-have-a-chance-to-show-what-they-can-do-but-they-still-cant-break-through/>



04/05/2020

La 'magia' de la realidad aumentada: una app copia objetos reales y los pega en el ordenador

Un programador y diseñador ha creado un sistema impactante de realidad aumentada que une el teléfono móvil y el ordenador de una forma no vista hasta ahora: basta con capturar un objeto desde la pantalla del móvil, y arrastrarlo al ordenador, para que automáticamente se pegue. Y con el fondo ya recortado, es uno de los usos más útiles e ingeniosos de la realidad aumentada.

<https://www.xatakamovil.com/aplicaciones/magia-realidad-aumentada-app-copia-objetos-reales-pega-ordenador>

18/05/2020

How Close Are We to Real 3D Holographic Technology?

One of the closest technologies to real holographic tech like we see in the movies is through augmented reality. These headsets, while most not available to the general public, provide everything that you'd imagine a 3D hologram would be. You can look out into the world around you and see things projected holographically into the space around you.

Technically speaking, what's being presented in augmented reality is really a hologram, i.e., it's a 3D virtual object that isn't really there but rather looks as though it is.



<https://interestingengineering.com/how-close-are-we-to-real-3d-holographic-technology>

18/05/2020

Manufacturing's new normal will involve augmented reality – PTC

Jim Heppelmann, CEO of the industrial technology specialist, believes the way frontline workers have seamlessly adapted to the benefits of AR to continue to perform their roles during the pandemic has paved the way for greater adoption and a desire to tap into huge cost savings and greater productivity.

Whilst Zoom and Microsoft Teams have become a norm for office workers, physical specialists have embraced digital transformation to build ventilators, deliver crucial training to apprentices and solve production bottlenecks on automotive lines.



<https://www.pesmedia.com/manufacturing-industry-augmented-reality-18052020/>



01/06/2020

Mirage VR S3 es la apuesta de Lenovo por la realidad virtual en las empresas

Lenovo acaba de anunciar la última incorporación a su cartera de soluciones empresariales de realidad virtual (RV): las gafas Lenovo Mirage VR S3 con ThinkReality. La nueva solución se presenta como es casco todo en uno desarrollado en colaboración con Pico Interactive.

Diseñado específicamente para el mundo empresarial, las Lenovo Mirage VR S3 cuentan con visor 4K, control manos libres para su uso con o sin el controlador que lo acompaña, y un antifaz facial higiénico y fácil de limpiar, adecuado para su uso intensivo. Desarrolladas con sistema de audio integrado y hasta tres horas de duración de la batería, las nuevas gafas de RV son robustas, ligeras y están preparadas para seguir el ritmo de la empresa.



<https://www.muycomputerpro.com/2020/06/01/mirage-vr-s3-es-la-apuesta-de-lenovo-por-la-realidad-virtual-en-las-empresas>

30/06/2020

Facebook's newest proof-of-concept VR headset looks like a pair of sunglasses

Apple's on-stage revelations of new augmented reality initiatives have largely focused on ARKit software, but the company has also been working on mixed reality hardware, as patents and reliable reports have amply established. While some of the patent documents are just nuts-and-bolts pieces, others have been eye-catching and unusual, including a newly filed application (via Patently Apple) that appears to be targeted at the business world: a plan to let headset wearers see real versions of secret documents and input devices, while outside observers are presented with fakes.



<https://www.forbes.com/sites/bernardmarr/2020/01/24/the-5-biggest-virtual-and-augmented-reality-trends-in-2020-everyone-should-know-about/?sh=1773e9c424a8>



PUBLICACIONES CIENTÍFICAS

ABRIL

Temporal continuity of visual attention for future gaze prediction in immersive virtual reality

Eye tracking technology is receiving increased attention in the field of virtual reality. Specifically, future gaze prediction is crucial in pre-computation for many applications such as gaze-contingent rendering, advertisement placement, and content-based design. To explore future gaze prediction, it is necessary to analyze the temporal continuity of visual attention in immersive virtual reality.

In this paper, the concept of temporal continuity of visual attention is presented. Subsequently, an autocorrelation function method is proposed to evaluate the temporal continuity. Thereafter, the temporal continuity is analyzed in both free-viewing and task-oriented conditions.

<https://www.sciencedirect.com/science/article/pii/S2096579620300188>

Supporting Teamwork in Industrial Virtual Reality Applications

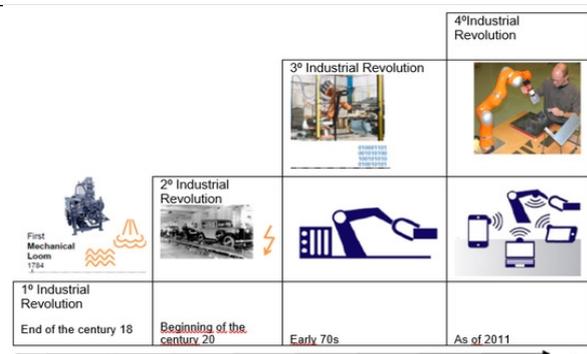
Virtual Reality (VR) systems allow for novel modes of visualization and interaction to support engineering design reviews. However, there are still research challenges to be addressed until companies can fully benefit from the technology's potential. Our previous research showed that social exclusion of VR users sharing the same physical space with colleagues during a design review session has a negative influence on the communication and cooperation among team members. The work in this paper presents approaches to counteract this issue in a shared VR space for industry purpose. We describe the implementation of our concepts based on touch input and visual cues in an interactive VR environment for design review. Our evaluation in laboratory setup reveals that simple visual cues provide effective means to reduce the time to find certain details in complex VR scenes. We conclude our work with thoughts on future development steps to foster the communication between team members in a diversified VR environment.

<https://www.sciencedirect.com/science/article/pii/S2351978920305552>

Model Proposal for Diagnosis and Integration of Industry 4.0 Concepts in Production Engineering Courses

In Industry 4.0, people need to be able to handle the vast amount of information from machines. In this sense, for Industry 4.0, higher education institutions play a fundamental role. The methodology of this article sought to identify the knowledge required by Industry 4.0 in the literature; carry out a diagnosis of the courses currently offered by Brazilian universities and the need to incorporate new knowledge, and validate the model in a real application.

<https://www.mdpi.com/2071-1050/12/8/3471>



MAYO

Haptic-feedback smart glove as a creative human-machine interface (HMI) for virtual/augmented reality applications

Human-machine interfaces (HMIs) experience increasing requirements for intuitive and effective manipulation. Current commercialized solutions of glove-based HMI are limited by either detectable motions or the huge cost on fabrication, energy, and computing power. We propose the haptic-feedback smart glove with triboelectric-based finger bending sensors, palm sliding sensor, and piezoelectric mechanical stimulators. The detection of multidirectional bending and sliding events is demonstrated in virtual space using the self-generated triboelectric signals for various degrees of freedom on human hand. We also perform haptic mechanical stimulation via piezoelectric chips to realize the augmented HMI. The smart glove achieves object recognition using machine learning technique, with an accuracy of 96%. Through the integrated demonstration of multidimensional manipulation, haptic feedback, and AI-based object recognition, our glove reveals its potential as a promising solution for low-cost and advanced human-machine interaction, which can benefit diversified areas, including entertainment, home healthcare, sports training, and medical industry.

<https://advances.sciencemag.org/content/6/19/eaaz8693>

Digital Twin and Virtual Reality Based Methodology for Multi-Robot Manufacturing Cell Commissioning

Intelligent automation, including robotics, is one of the current trends in the manufacturing industry in the context of “Industry 4.0”, where cyber-physical systems control the production at automated or semi-automated factories. Robots are perfect substitutes for a skilled workforce for some repeatable, general, and strategically-important tasks. However, this transformation is not always feasible and immediate, since certain technologies do not provide the required degree of flexibility. The introduction of collaborative robots in the industry permits the combination of the advantages of manual and automated production.



<https://www.mdpi.com/2076-3417/10/10/3633>

MVC-3DC: Software architecture model for designing collaborative augmented reality and virtual reality systems

In this paper, software architecture model “MVC-3DC” for Collaborative Augmented and Virtual Reality Systems design is proposed. This model is the results of merging several aspects: Human-Computer Interaction (HCI), distribution systems, computer-supported cooperative work (CSCW) and new technologies such as augmented reality and virtual reality. MVC-3DC integrates collaboration principles between remote users. MVC-3DC allows a low dependency between components such as the core functions, 3D graphics API and data distribution modes. The proposed architectural model integrates simulation models, SDKs and algorithms for different nodes involved in a collaborative session. This facilitates interoperability and capability to manage heterogeneity and relationship between different nodes participating in the collaborative session. Finally, our model makes it possible to integrate other toolkits without completely changing the structure of collaboration model. A simple adaptation could be made.

<https://www.sciencedirect.com/science/article/pii/S1319157819302320>



JUNIO

IC.IDO as a tool for displaying machining processes. The logic interface between Computer-Aided-Manufacturing and Virtual Reality

This scientific communication investigates the logic interface of a CAM solver, i.e., MasterCAM, into a Virtual Reality (VR) environment. This integration helps in displaying machining operations in virtual reality. Currently, to partially visualize the results of a simulation in an immersive environment, an import/export procedure must be done manually. Here, a software plugin integrated into IC.IDO (by ESI Group) has been realized and fully described. This application allows the complete integration of CAM solver into the VR environment. In particular, the VERICUT solver has been integrated into VR. This kind of integration has never been done yet.

<https://www.sciencedirect.com/science/article/pii/S2212827120303413>

HapticSnakes: multi-haptic feedback wearable robots for immersive virtual reality

Haptic feedback plays a large role in enhancing immersion and presence in VR. However, previous research and commercial products have limitations in terms of variety and locations of delivered feedbacks. To address these challenges, we present HapticSnakes, which are snake-like waist-worn robots that can deliver multiple types of feedback in various body locations, including taps-, gestures-, airflow-, brushing- and gripper-based feedbacks. We developed two robots, one is lightweight and suitable for taps and gestures, while the other is capable of multiple types of feedback. We presented a design space based on our implementations and conducted two evaluations

<https://link.springer.com/article/10.1007/s10055-019-00404-x>

The Application of Augmented Reality in the Automotive Industry: A Systematic Literature Review

Augmented reality (AR) is a fairly new technology enabling human machine interaction by superimposing virtual information on a real environment. Potential applications can be found in many areas of research from recent years. This study presents a systematic review of existing AR systems in the automotive field, synthesizing 55 studies from 2002 to 2019. The main research questions are: where AR technology has been applied within the automotive industry, what is the purpose of its application, what are the general characteristics of these systems, and what are the emphasized benefits and challenges of using AR in this field? The aim of this paper is to provide an insight into the AR applications and technologies in the automotive field

<https://www.mdpi.com/2076-3417/10/12/4259>



Creating the Internet of Augmented Things: An Open-Source Framework to Make IoT Devices and Augmented and Mixed Reality Systems Talk to Each Other

Augmented Reality (AR) and Mixed Reality (MR) devices have evolved significantly in the last years, providing immersive AR/MR experiences that allow users to interact with virtual elements placed on the real-world. However, to make AR/MR devices reach their full potential, it is necessary to go further and let them collaborate with the physical elements around them, including the objects that belong to the Internet of Things (IoT). Unfortunately, AR/MR and IoT devices usually make use of heterogeneous technologies that complicate their intercommunication. Moreover, the implementation of the intercommunication mechanisms requires involving specialized developers with have experience on the necessary technologies. To tackle such problems, this article proposes the use of a framework that makes it easy to integrate AR/MR and IoT devices, allowing them to communicate dynamically and in real time. The presented AR/MR-IoT framework makes use of standard and open-source protocols and tools like MQTT, HTTPS or Node-RED. After detailing the inner workings of the framework, it is illustrated its potential through a practical use case: a smart power socket that can be monitored and controlled through Microsoft HoloLens AR/MR glasses. The performance of such a practical use case is evaluated and it is demonstrated that the proposed framework, under normal operation conditions, enables to respond in less than 100 ms to interaction and data update requests

<https://www.mdpi.com/1424-8220/20/11/3328>



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.

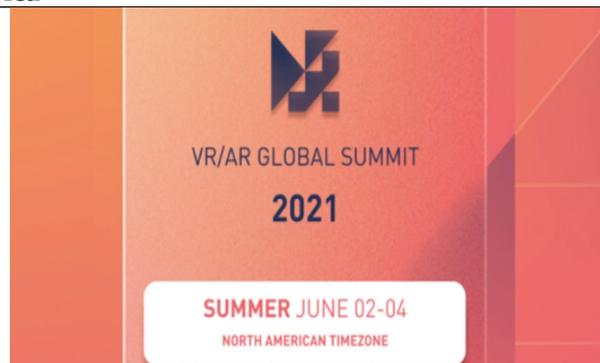


<https://xr-summit.org/about-2/>

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>

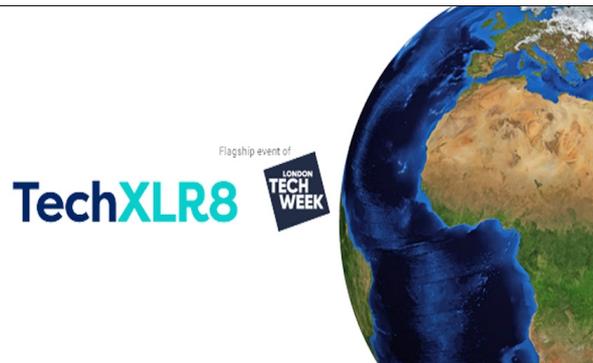
7 JUNIO 2021

AR & VR WORLD SUMMIT | TECHCLR8 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/>



7-11 JULIO 2021 LAVAL - FRANCIA

LAVAL VIRTUAL EUROPE

Every year since 20+ years, the town of Laval (Mayenne, France), has become the capital of virtual and augmented reality. During 3 days, all the major VR/AR players gather at Laval Virtual. It's a wonderful opportunity to discover and meet 300+ exhibitors of the VR/AR field. The exhibition invites renowned speakers from 50 countries to take part in the rich and visionary programme of the 4 conference cycles. Let's meet on 7-9th July 2021 for the 23rd edition!

<https://www.laval-virtual.com/>



29 SEP-1 OCTUBRE 2021

VR/AR Global Summit 2021 – EUROPE



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://www.vrarglobalsummit.com/>



20 OCTUBRE 2021

Enterprise Wearable Technology Summit

EWTS is one of the world's leading events for enterprise-grade wearables and AR/VR tech. This year, over 1,500 people are expected to attend as 75+ exhibitors, 100+ enterprise presenters, and 70+ educational sessions discuss how their XR products, solutions, and strategies are going to reshape the corporate world in the future.



<https://www.brainxchange.com/events/ewts-2020/event-home>

