



Interreg
España - Portugal



UNIÓN EUROPEA

Fondo Europeo de Desarrollo Regional



MAIN GAP

REALIDAD AUMENTADA Y VIRTUAL.

BOLETÍN DE VIGILANCIA TECNOLÓGICA.

JULIO-SEPTIEMBRE 2020.

AXENCIA GALEGA DE INNOVACIÓN – CIS TECNOLOXÍA E DESEÑO



XUNTA
DE GALICIA



CEIIA



Universidade do Minho



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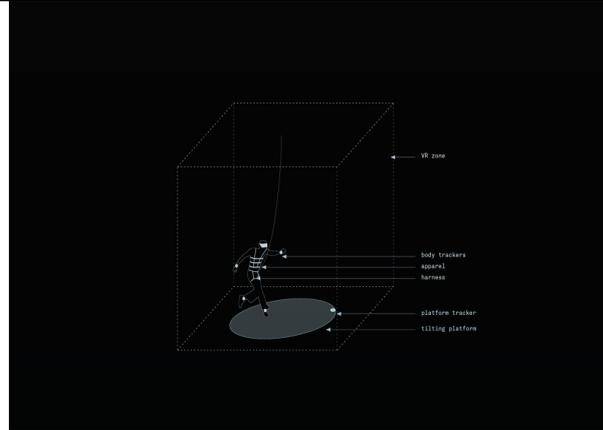


NOTICIAS

07/2020

Un(Balance) @ Interactive Architecture Lab

(Un)Balance is an experience in XR (extended reality) which rethinks human-spaces interactions by foregrounding the notion of embodiment. It provokes body awareness, movement and exploration.



<https://elynelegarnisson.myportfolio.com/unbalance-at-interactivearchitecturelab>

15/07/2020

2021 Mercedes S-Class Will Feature AR Navigation And 3D Eye-Tracking

AR-enhanced navigation and 3D stereoscopic displays arriving later this year. German automotive manufacturer Mercedes-Benz has never been shy about its love for immersive technology. In the past the luxury vehicles company has experimented with numerous VR and AR applications, from an AR owners manual and VR car-buying experience to an AR-enhanced vehicle tour and multiple 360-degree videos. Now it appears as though the company is taking things a step forward by applying that same technology to the vehicles themselves.



<https://vrscout.com/news/mercedes-s-class-ar-navigation-3d-eye-tracking/>



15/08/2020

RYCA Unveils The World's First Custom Motorcycle Built with Augmented Reality

Augmented reality proved to be a game-changer in the prototyping phase of the new CS-1X, allowing us to quickly test out different design options and sketch out ideas “virtually”. CAD is great, but there’s nothing like seeing things in person. With AR, we were able to go beyond the computer screen and experience the look and feel of each component, all before fabrication and assembly.



<https://rycamotors.com/news/ryca-unveils-the-worlds-first-custom-motorcycle-built-with-augmented-reality/>

7/09/2020

Uso de realidad aumentada y realidad virtual en la Industria 4.0

La Industria 4.0, en el marco de la Cuarta Revolución Industrial, hace referencia a un cambio en el modelo organizativo de los medios de producción consistente en la implementación de tecnologías digitales como la realidad aumentada o la realidad virtual. Esta digitalización industrial dará pie a fábricas inteligentes, mucho más flexibles e hiperconectadas, que aventajen respecto a la industria convencional en materias como la eficiencia, la productividad, la calidad o la seguridad.



<https://altertecnica.com/realidad-aumentada-realidad-virtual-industria-40/>



16/09/2020

Facebook's Project Aria Will Pave The Way For Consumer-Friendly AR

It's no secret that virtual reality is an effective tool for hard skills training and job simulations. From aviation to manufacturing, it gives trainees realistic simulations of their work stations without putting them in harm's way. In a recent PwC study, it shows that VR also makes soft skills training more impactful.



Here, we're going to delve into the effectiveness of VR for soft skills training. We're going to see how it can be advantageous, especially in our ever-changing workplace environment.

<https://vrscout.com/news/facebook-project-aria-ar-headset/>

24/09/2020

New PwC Report: The Effectiveness of Virtual Reality Soft Skills Training

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<https://arpost.co/2020/07/24/pwc-virtual-reality-soft-skills-training/>



27/09/2020

The DecaGear 4K SteamVR Headset Sounds Too Good To Be True

Earlier this month, Singapore-based Deca announced the DecaGear, a PC VR headset boasting some pretty incredible features for a suspiciously low price.

Available now for preorder, the DecaGear features 2,160 × 2,160 (4.6MP) per-eye resolution at 90Hz, two inward-facing cameras allowing for face tracking, four-camera inside-out tracking, hip tracking provided by the DecaMove attachment, pressure-sensitive controllers similar to that of the Valve Index, IPD adjustment, and support for SteamVR; all for the price of just \$450. That's a remarkably cheap price tag considering what's being offered.

<https://vrscout.com/news/decagear-4k-steamvr-headset/>



28/09/2020

The 5G trials explore two industrial use cases: augmented reality and a telepresence robot for remote visits

Orange has teamed up with energy management and automation company Schneider Electric on the deployment of 5G inside Le Vaudreuil, a French factory located in France's industrial sector. The trial has been in operation since March and according to the companies, "aims to use 5G in a modern industrial environment to build reliable, scalable and sustainable connectivity solutions for future industrial needs."

5G promises improved capabilities in a number of areas, but when it comes to the industrial sector in particular, the next generation of cellular technology is expected to help synchronize large amounts of data in real time, boosting performance and ensuring optimal production efficiencies.

<https://www.rcrwireless.com/20200928/carriers/orange-schneider-electric-trial-two-industrial-5g-use-cases-in-france>



PUBLICACIONES CIENTÍFICAS

JULIO

Augmented Reality and Virtual Reality Displays: Perspectives and Challenges

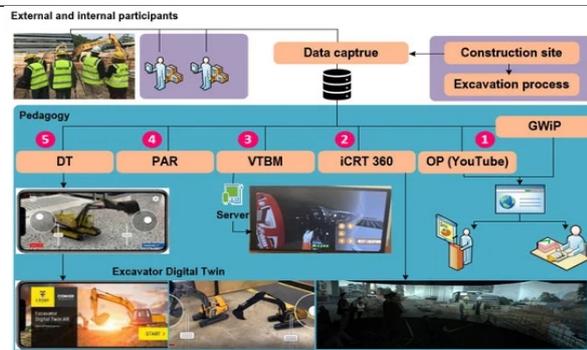
As one of the most promising candidates for next-generation mobile platform, augmented reality (AR) and virtual reality (VR) have potential to revolutionize the ways we perceive and interact with various digital information. In the meantime, recent advances in display and optical technologies, together with the rapidly developing digital processors, offer new development directions to advancing the near-eye display systems further. In this perspective paper, we start by analyzing the optical requirements in near-eye displays poised by the human visual system and then compare it against the specifications of state-of-the-art devices, which reasonably shows the main challenges in near-eye displays at the present stage. Afterward, potential solutions to address these challenges in both AR and VR displays are presented case by case, including the most recent optical research and development, which are already or have the potential to be industrialized for extended reality displays.

<https://www.sciencedirect.com/science/article/pii/S258900422030585X>

Digital Twin and Web-Based Virtual Gaming Technologies for Online Education: A Case of Construction Management and Engineering

Mixed reality is advancing exponentially in some innovative industries, including manufacturing and aerospace. However, advanced applications of these technologies in architecture, engineering, and construction (AEC) businesses remain nascent. While it is in demand, the use of these technologies in developing the AEC digital pedagogy and for improving professional competence have received little attention. This paper presents a set of five novel digital technologies utilising virtual and augmented reality and digital twin, which adds value to the literature by showing their usefulness in the delivery of construction courses.

<https://www.mdpi.com/2076-3417/10/13/4678>



A Study on the Deduction and Diffusion of Promising Artificial Intelligence Technology for Sustainable Industrial Development

Based on the rapid development of Information and Communication Technology (ICT), all industries are preparing for a paradigm shift as a result of the Fourth Industrial Revolution. Therefore, it is necessary to study the importance and diffusion of technology and, through this, the development and direction of core technologies. Leading countries such as the United States and China are focusing on artificial intelligence (AI)'s great potential and are working to establish a strategy to preempt the continued superiority of national competitiveness through AI technology. This is because artificial intelligence technology can be applied to all industries, and it is expected to change the industrial structure and create various business models. This study analyzed the leading artificial intelligence technology to strengthen the market's environment and industry competitiveness. We then analyzed the lifecycle of the technology and evaluated the direction of sustainable development in industry.

<https://www.mdpi.com/2071-1050/12/14/5609>

AGOSTO

Virtual reality based digital chain for creating a knowledge base of hand gestures in maintenance tasks

Hand gestures are key aspects in maintenance work. In this paper, we present a methodology for creating a digital knowledge base of maintenance hand gestures by applying virtual reality technology. Our motivation is rooted in the need to create work instructions that shall illustrate details of hand gestures that are the appropriate for particular maintenance operations. In this research, we propose an approach of recording, classifying and clustering such hand gestures in a library of gesture. Within this library, we can characterize each gesture and relate them to mechanical assembly and disassembly operations with respect to their appropriateness. Through this relationship, we create a knowledge base that can be used for suggesting hand gestures, as well as for rating them in e.g. training tasks. Furthermore, key elements of work instructions for operators can be derived from it. As a demonstration, we showed the process chain applied to the process of registration of hand gesture in simply maintenance task.

<https://www.sciencedirect.com/science/article/pii/S2212827120302997>

A research agenda for augmented and virtual reality in architecture, engineering and construction

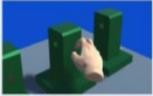
This paper presents a study on the usage landscape of augmented reality (AR) and virtual reality (VR) in the architecture, engineering and construction sectors, and proposes a research agenda to address the existing gaps in required capabilities. A series of exploratory workshops and questionnaires were conducted with the participation of 54 experts from 36 organisations from industry and academia. Based on the data collected from the workshops, six AR and VR use-cases were defined: stakeholder engagement, design support, design review, construction support, operations and management support, and training.

<https://www.sciencedirect.com/science/article/pii/S1474034620300914>



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Type of maintenance task	Pattern of hand gesture	Definition	Hand gesture
Removing Sheet Metal Screws	Pinch with T11 T = Thumb I1 = Side of Index	This hand gesture use Thumb and side of Index to pinch the screw and rotate the screw to left or right. This hand gesture will use with the small head of screw and round head screw.	
Removing Hex Lag Screws	Pinch with T12 T = Thumb I2 = End of Index	This hand gesture use Thumb and End of Index to pinch the screw and rotate the screw to left or right. This hand gesture will use with the hexagonal screws and square screws.	
Removing Wood Screws	Pinch with T11 T = Thumb I1 = Side of Index	This hand gesture use Thumb and side of Index to pinch the screw and rotate the screw to left or right. This hand gesture will use with the small head of screw and round head screw.	

<https://www.sciencedirect.com/science/article/pii/S2212827120302997#fig0006>

Synthetic prototype environment for industry 4.0 testbeds

This publication presents a synthetic prototype environment to facilitate and stimulate the interaction with industry 4.0 testbed. The proposed solution facilitates a sandboxing approach to support multi-criterion and multi-stakeholder decision making with respect to the configuration challenges in the development of a production environment. The synthetic prototyping environment combines a real tangible scaled version of a (potential) production environment with virtual elements to quickly (re)configure (potential) environments and review the consequences of changes. The solution provides both personalised (AR/VR) and collective visualisations, and (collaborative) interactions with all stages of the digital system reference, enabling an effortless change of perspectives between the digital master, digital prototype and digital twin.

<https://www.sciencedirect.com/science/article/pii/S2212827120308593>

SEPTIEMBRE

Interaction design for multi-user virtual reality systems: An automotive case study

Virtual reality (VR) technology have become ever matured today. Various research and practice have demonstrated the potential benefits of using VR in different application area of manufacturing, such as in factory layout planning, product design, training, etc. However, along with the new possibilities brought by VR, comes with the new ways for users to communicate with the computer system. The human computer interaction design for these VR systems becomes pivotal to the smooth integration. In this paper, it reports the study that investigates interaction design strategies for the multi-user VR system used in manufacturing context though an automotive case study.

<https://www.sciencedirect.com/science/article/pii/S2212827120305965>



Virtual Factory: Digital Twin Based Integrated Factory Simulations

The co-evolution problem, which is known as the concurrent evolution of products, processes and production systems, along with increased complexity and shorter manufacturing operation lifecycles, makes modelling, simulation and evaluation of such operations challenging activities for industry players. This paper presents the concept of a digital twin-based virtual factory (VF) and its architecture to support modelling, simulation and evaluation of manufacturing systems while employing multi-user (collaborative and coordinated) virtual reality (VR) learning/training scenarios. This paper also addresses how digital twin-based virtual factory can support factory lifecycle processes by demonstrating the concept in a wind turbine manufacturing plant, including preliminary evaluation by industry experts.

<https://www.sciencedirect.com/science/article/pii/S2212827120306077>

New Approach for Digital Factory Using Virtual Reality Technology

The digital factory represents an indispensable method for factory layout planning. Based on digital factory methods numerous tools for layout planning have been developed in the last years, which enable the space organization of the assets of a factory based on 2D/3D data. Such tools have a difficulty to show the whole layout plan and to interact and to handle with the factory assets in intuitive and realistic manner. This paper presents and discuss a VR-based approach for efficient factory planning. This approach enables fully immersion in the virtual environment represented factory and an intuitive interaction with factory equipment. Hence, the layout planning can be assessed in real time regarding e.g. efficiency of surface use, material flow, ergonomics. The presented approach has been designed based on the many years experience of the author as digital factory engineer in the industry and based on intensive discussion with industry experts.

<https://www.sciencedirect.com/science/article/pii/S2212827120305527>



EVENTOS

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>

