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MAINGAP

**OPERARIO SENSORIZADO Y
ROBÓTICA COLABORATIVA**
BOLETÍN DE VIGILANCIA TECNOLÓGICA.
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SECCIÓN I. OPERARIO SENSORIZADO

NOTICIAS

07/04/2021

Deep Learning Software Recognizes Component Discrepancies From Target Dimensions

Quality control is key to the manufacturing industry. Does a physical component fail to meet the requirements specified in the CAD data? Until now, employees have carried out visual inspections to find out. Researchers at Fraunhofer IGD are now developing a much more precise alternative using developed MARQUIS software. The MARQUIS software combines augmented reality with machine learning methods to allow comparisons to be made between a CAD specification and the real product. "The system recognizes the component and also identifies any discrepancies from the target dimensions," says Holger Graf, scientist at Fraunhofer IGD, explaining the technology.



<https://metrology.news/deep-learning-software-recognizes-component-discrepancies-from-target-dimensions/>

21/04/2021

iiQKA.OS futuro sistema operativo de KUKA marcará el comienzo de una nueva era en robótica

KUKA ha presentado los primeros elementos del futuro sistema operativo, iiQKA.OS, en el Hannover Messe digital. El nuevo sistema operativo formará la base de todo un ecosistema, proporcionando acceso a una poderosa selección de componentes, programas, aplicaciones, servicios y equipos que son fáciles de instalar, operar y usar para mejorar el sistema. Este ecosistema iiQKA basado en iiQKA.OS hará posible que las personas recién llegadas al mundo de la robótica implementen la automatización sin capacitación especializada, al tiempo que mejora y simplifica enormemente el proceso para los expertos.



El cobot LBR iisy será el primero de su tipo que se ejecutará exclusivamente en el nuevo sistema operativo compatible con el ecosistema iiQKA, en combinación con el controlador de micro robot KR C5 y el nuevo dispositivo de operador smartPAD pro.

<https://www.infoplcn.net/noticias/item/109533-iiqka-os-sistema-operativo-kuka-nueva-era-robotica>

05/05/2021

La Realidad Aumentada permite el mantenimiento y operación de entornos industriales complejos y remotos

El nuevo software de Ibermática trae consigo una importante reducción de costes asociados a mantener personal muy especializado en ubicaciones remotas, o al tiempo y gastos de viaje que implica el desplazamiento del experto hasta la ubicación de la máquina, o a la pérdida de capacidad productiva mientras la máquina y el proceso asociado están parados, entre otras cosas. Dentro del sector industrial actual existe una fuerte vocación de internacionalización, lo que obliga a realizar la atención post-venta y el mantenimiento en ubicaciones remotas. Servicios que deben ofrecerse de manera rápida y eficaz para garantizar que las empresas implementen un sistema de producción eficiente.



<https://www.infoplcn.net/noticias/item/109607-realidad-aumentada-mantenimiento-entornos-industriales-complejos-remotos>



13/05/2021

Skoda prueba gafas de realidad aumentada en mantenimiento de producción

Skoda está probando una solución de realidad aumentada, las gafas HoloLens, para proporcionar asistencia al mantenimiento de la línea de producción. Estos dispositivos permiten proyectar manuales, listas de control de mantenimiento y otros documentos como imágenes holográficas en el campo visual inmediato del usuario. La visión a través de las gafas AR también puede compartirse durante videoconferencias y puede utilizarse para fines formativos. Como parte del actual proyecto piloto, Skoda confía en la realidad aumentada para optimizar el mantenimiento y la reparación de máquinas y minimizar el índice de error.



<https://www.auto-revista.com/texto-diario/mostrar/2884078/skoda-prueba-gafas-realidad-aumentada-mantenimiento-produccion>



PUBLICACIONES CIENTÍFICAS

Abril/2021

Evaluation of a passive low-back support exoskeleton (Ergo-Vest) for manual waste collection

Mansour Ziaei, Alireza Choobineh, Haleh Ghaem, Mohammad Abdoli-Eramaki

The purpose of study was to determine the biomechanical, physiological, and subjective effect of a Passive Exoskeleton device (called Ergo-Vest) among 20 waste collectors in the working environment. Compression force and moment on L4/L5 related to 400 critical postures of the participants were estimated using the 3DSSPP software. The heart rate and energy expenditure are measured as the physiological strain using the Polar RS400 Heart Rate Monitor. Borg scale perceived exertion, system usability scale, and ergonomic design indicators of the device were collected as the subjective parameters. Compression force and moment on L4/L5 disc were decreased when the Ergo-Vest was utilised. There was no significant difference in energy expenditure and heart rate with and without the device. The workers' perceived physical exertion was decreased while using the Ergo-Vest. From the perspective of end users, the usability and ergonomic design features of the Ergo-Vest was acceptable.

<https://www.tandfonline.com/doi/abs/10.1080/00140139.2021.1915502?journalCode=terg20&>

Mayo/2021

Exoskeletons in Automotive Industry: Investigation into the Applicability Across Regions

Chiara Carnazzo, Stefania Spada, Lidia Ghibaudo, Lynn Eaton, Izonei Fajardo, Shi Zhu, Maria Pia Cavatorta

In the present day, manufacturing companies are constantly facing new challenges, mostly deriving from the possibilities offered to industry by the fourth industrial revolution. New capabilities and services are available for customers and companies by advanced technologies and interconnections, changing the way we live, work and relate to one another. A promising example of Human-Robot Collaboration is the exoskeleton, a wearable device that interacts with the users to reduce the strain associated to the repetitive tasks present in the manufacturing environment. Fiat Chrysler Automobiles (FCA) (The company merged with PSA creating Stellantis N.V. in January 2021. Abstract was submitted at an earlier stage.), a multinational corporation operating into four (4) Regions: EMEA, North America, LATAM and APAC, had the opportunity to benchmark and test exoskeletons in the different Regions. The focus of the present paper is to present a collaborative approach within Regions on exoskeletons application and feasibility studies including experimental tests, key performance indicators and legal requirements. Main aspects and results are presented together with the open questions.

https://link.springer.com/chapter/10.1007/978-3-030-74608-7_50



Junio/2021

Human-Robot Collaboration (HRC) Technologies for Reducing Work-Related Musculoskeletal Diseases in Industry 4.0

Alberto Ranavolo, Giorgia Chini, Francesco Draicchio, Alessio Silvetti, Tiwana Varre cchia, Lorenzo Fiori, Antonella Tatarelli, Patricia Helen Rosen, Sascha Wischniewski, Philipp Albrecht, Lydia Vogt, Matteo Bianchi, Giuseppe Averta, Andrea Cherubini

The paper describes the activities of the European project SOPHIA, Socio-Physical Interaction Skills for Cooperative Human-Robot Systems in Agile Production. The consortium involves European partners from academia, research organizations and industry. The main goal of the project is to develop a new generation of CoBots and Wearbots and advanced instrumental-based biomechanical risk assessment tools in industrial scenarios to reduce work-related musculoskeletal disorders and to improve productivity in industry 4.0.

https://link.springer.com/chapter/10.1007/978-3-030-74614-8_40



SECCIÓN II. ROBÓTICA COLABORATIVA

NOTICIAS

06/04/2021

La gama de robots TS2 Scara de Stäubli se alza con el prestigioso premio "Red Dot Design Award 2021"

Cuando el diseño se suma al rendimiento: Stäubli Robotics ha mostrado su satisfacción al anunciar que ha ganado el prestigioso premio Red Dot Design Award 2021 por su gama de robots TS2 Scara. Con esta gama, Stäubli ha desarrollado una línea de robots de 4 ejes extremadamente potentes diseñados para satisfacer las demandas más estrictas en ámbitos como los sectores de automoción, alimentario, farmacéutico, plástico y eléctrico o electrónico. Los Selective Compliance Assembly Robot Arms (SCARA) son útiles en una variedad de aplicaciones. Pueden realizar tareas precisas y repetitivas, como carga/descarga, montaje, packaging/paletización, pick and place/manipulación, clasificación, apilado y espaciado, a velocidades muy elevadas.



<https://www.izaro.com/la-gama-de-robots-ts2-scara-de-staubli-se-alza-con-el-prestigioso-premio-red-dot-design-award-2021-/c-1617608871/>

30/04/2021

Nueva generación de robots para una mayor automatización, productividad y flexibilidad

En el campo de las soluciones robóticas, Ideko ha puesto en práctica su conocimiento al frente del proyecto europeo COROMA, una iniciativa concluida a finales de 2019 que ha servido para desarrollar un nuevo concepto de robot industrial inteligente, que permite ejecutar múltiples procesos para la fabricación de piezas metálicas y de materiales compuestos en el sector naval, aeronáutico y energético.



<https://www.interempresas.net/Aeronautica/Articulos/302954-Nueva-generacion-de-robots-para-una-mayor-automatizacion-productividad-y-flexibilidad.html>



19/05/2021

Innovación y cobots: un binomio al servicio de los centros integradores españoles

El trabajo de los centros integradores certificados en España de Universal Robots, especialista internacional de robótica colaborativa, está ayudando a muchas empresas, especialmente a pymes, a optimizar sus procesos. Para dar a conocer la labor de estos integradores 'Made in Spain' y acercar la tecnología robótica y sus múltiples aplicaciones, el fabricante danés ha puesto en marcha la campaña CSI Integrando cobots en la industria española.



<https://www.interempresas.net/Aeronautica/Articulos/349776-Innovacion-y-cobots-un-binomio-al-servicio-de-los-centros-integradores-espanoles.html>

08/06/2021

KUKA integra sus robots móviles en la fábrica de Mercedes-Benz

La fábrica de Mercedes-Benz anteriormente disponía de un sistema de transporte por medio de plataformas guiadas por orugas que ahora ha sustituido por un nuevo sistema intralogístico compuesto por robots AGV de KUKA que optimizan el proceso de manera autónoma y aportan mayor flexibilidad a los envíos de materiales. La solución robótica integrada por KUKA ha dado como resultado una producción flexible y adaptable a las necesidades productivas del cliente. Los siete robots móviles pueden llevar una carga útil de hasta 1500 kilogramos por lo que son perfectos para transportar las cabinas de los camiones entre las diferentes estaciones de producción que componen la línea de montaje.



<https://www.hisparob.es/kuka-integra-sus-robots-moviles-en-la-fabrica-de-mercedes-benz/>



PUBLICACIONES CIENTÍFICAS

Abril/2021

Training for smart manufacturing using a mobile robot-based production lin

Shuting Wang, Liquan Jiang, Jie Meng, Yuanlong Xie, Han Ding

Practice experimentation that integrates the manufacturing processes and cutting-edge technologies of smart manufacturing (SM) is essential for future academic and applied engineering personnel. The broadening efficacy of hands-on experience in SM engineering education has been manifested. In this regard, a reference practical system is proposed in this study for hands-on training in SM crucial advancements. The system constructs a mobile robot-based production line (MRPL) to increase participants' interest in theoretical learning and professional skills. The MRPL-based reference system includes the comprehensive principles and processes involved in modern SM factories from warehousing to logistics, processing, and testing. With key features of modularity, integrability, customizability, and open architecture, this system has a threefold objective. First, it is an interdisciplinary subject that enables students to translate classroom learning into authentic practices, thus facilitating knowledge synthesis and training involvements. Second, it offers effective support to cultivate the attributions and behavioral competencies of SM talents, such as perseverance, adaptability, and cooperation. Third, it promotes students' capacities for critical thinking and problem solving so that they can deal with the difficulties that physical systems have and motivates them to pursue careers with new syllabi, functions, and process technologies. The received positive evaluations and assessments confirm that this MRPL-based reference system is beneficial for modern SM talent training in higher engineering education.

<https://link.springer.com/article/10.1007/s11465-020-0625-z>

Junio 2021

Towards an Artificial Perception Framework for Autonomous Robots in Logistics

Christopher Mayershofer, Johannes Fottner

Autonomous robots in logistics are a promising approach towards a fully automated material flow. In order to use their full potential however, they must be able to extract semantic information from logistics environments. In contrast to other application areas of autonomous robots (e.g. autonomous driving, service robotics) the logistics domain lacks a common dataset and benchmark suite covering multiple sensor modalities and perception tasks. This paper conceptualizes a framework for artificial perception research in logistics that aims to close this gap in a sustainable, data-driven way. Our framework consists of three



components: (1) A foundation, based on logistics-specific standards, concepts and requirements. (2) An open dataset, covering multiple sensor modalities and perception tasks and (3) a standardized benchmark suite. As shown in other research areas, a common and open platform for data-driven research facilitates novel developments and makes results comparable and traceable over time.

https://link.springer.com/chapter/10.1007/978-3-662-62962-8_47



SECCIÓN III. EVENTOS INDUSTRIA 4.0



Manufacturing Data Summit

01-02 Junio 2021, Evento virtual

Returning in 2021 as a virtual event, Manufacturing Data Summit provides an international forum for manufacturing and critical infrastructure leaders driving digital transformation across Europe. As the adoption of Industry 4.0 technologies and processes shifts from being an advantage point to a necessity, senior industry leaders gather to explore how to boost performance through technology, launch pioneering projects and drive operational efficiency while creating cross-functional synergies and combining technical expertise with strategic vision.

<https://europe.manufacturingdata.io/>



Advanced Factories 2021

08-10 Junio 2021, Barcelona

Advanced Factories, es la cumbre anual sobre innovación industrial. Una plataforma para presentar únicamente las



últimas innovaciones en equipos de Automatización Industrial junto con las tecnologías que emergen de la Industria 4.0. Junto al mayor congreso europeo sobre innovación industrial, el Industry 4.0 Congress en el que expertos de primer orden internacional dan las claves para implementar nuevos modelos de negocio y profundizan en las tendencias tecnológicas más punteras entorno a la Industria Avanzada.

www.advancedfactories.com

Sensors & IIoT
Manufacturing + Automation + Robotics
EMEA & UK - Virtual Event
16th & 17th June 2021

Sensors & IIoT Manufacturing + Automation + Robotics

16 –17 junio 2021, Evento virtual

Our full agenda will be published shortly, in the meantime check out some of the topics being covered and find out about how professionals in this field are implementing advanced sensing and IoT technologies. Key topics being explored include: Journey to Smart Factory | Combining AI and IoT to Improve Efficiency; The value of Sensors – Benefits of Digitisation | Optimising Industrial IoT (IIoT); Smart Manufacturing and Adaptability through Sensors | Robots and Cobots – the Robotics Evolution; Digital Transformation Post-Pandemic | Blockchain Enabled Sensors; Data Analytics and Advanced Sensing Technologies | Implementing Industry 4.0.

<https://transformindustry.com/events/sensors-iiot-manufacturing-automation-robotics-emea-uk/agenda-at-a-glance/>

IoTWeek | Dublin
31 Aug - 3 Sept, 2021

10th IoT Week

31 agosto – 3 septiembre 2021, Dublín

The IoTWeek 2021 conference will be in a hybrid format, with the possibility of attendance as a virtual delegate or a virtual sponsor/exhibitor as an alternative to physical attendance, for anyone unable to travel. All sponsors and exhibitors will be featured appropriately in the online Conference Platform and Conference App, with virtual display space and features to augment a possible physical stand area. Therefore, in addition to the opportunities of the face-to-face meetings in our exhibition area, sponsors and exhibitors will have wider interaction with a much larger global community through the virtual platform.

<https://iotweek.org/>





Munich_i Hightech Summit 2021

22 junio 2021, Evento virtual

The one-day virtual Hightech Summit on June 22 is at the center of munich_i. Acclaimed pioneers and leading international masterminds from the field of AI and robotics to discuss their visions, innovations, insights and theories. Under the theme of intelligence empowering tomorrow, the entire program revolves around responsible technological change and the interaction between human and artificial intelligence. munich_i is under the patronage of the Bavarian Minister President Dr. Markus Söder, who will also open the summit.

<https://automatica-munich.com/en/trade-fair/munich-i/summit/>



Global Industrie 2021

6 –9 septiembre 2021, Lyon

Global Industrie 2021 es un evento de referencia para el sector industrial. Cubrirá a toda la industria y le permitirá descubrir todas las soluciones, tecnologías, servicios y conocimientos técnicos que necesita para la industria de hoy y mañana. Global Industrie 2021 acoge cuatro salones en su interior: MIDEST, referencia internacional para la subcontratación; SMART INDUSTRIES, espacio para la fábrica inteligente conectada, colaborativa y eficiente, INDUSTRIE, el mayor evento para tecnologías de producción y equipos, y TOLEXPO, la feria internacional para trabajar metal en láminas, bobinas, tubos y secciones.

<https://global-industrie.com/fr>





7th Industry of Things World

20-21 septiembre 2021, Evento virtual

The 7th edition of Industry of Things World – the leading event on Industrial IoT - will be hybrid! Hybrid 2021 – Both live in Berlin and online via our digital event platform hubs101, the leading IIoT event brings together more than 450 top experts from leading European manufacturing companies. Join now and discuss use and business cases like IIoT Strategy, New Business & Service Models, Smart Factory, Industry 4.0, Smart Supply Chain, Operational Excellence, Condition Monitoring, RPA, AR & VR as well as Data & Technical Infrastructure and IoT Networks & Security with your peers.

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



International Robot Safety Conference

20-22 septiembre 2021, Evento virtual

Demand for robotics is at an all-time high and robot safety is paramount to your success. Hosted by the Association for Advancing Automation, the International Robot Safety Conference (IRSC) will offer conference sessions and workshops that examine key issues in robot safety and provides an in-depth overview of current industry standards. IRSC is the leading robot safety conference. Companies have relied on this event to help improve their safety programs for 33 years. For the second year, IRSC will be a virtual event in 2021. This essential conference is normally priced at over \$1,000, but thanks to our sponsors, we can offer this great content virtually for just \$395 for A3 members and \$495 for non-members. Register today to join hundreds of your peers at IRSC!

<https://www.automate.org/a3-content/international-robot-safety-conference>





EMO Milán 2021

4-9 octubre 2021, Milán

Promovida por CECIMO, la exposición mundial de máquina herramienta se llevará a cabo del 4 al 9 de octubre en el centro de exposiciones de Fiera Milano. La exposición presenta las últimas novedades para la formación de metal y máquinas herramientas de corte de metal, máquinas para soldar, para tratamientos térmicos y superficiales, robots, automatización de hardware y software, montaje, herramientas, partes, componentes, accesorios, metrología, control de calidad y sistemas de seguridad. El foco estará en la amplia oferta de máquinas de herramientas disponibles, capaces de atraer a los usuarios de todos los sectores principales que utilizan sistemas de trabajo de metal.

<https://emo-milano.com/en/homepage-4/>

