SmartLivingPlat

Plataforma Tecnológica de la Domótica y las Ciudades Inteligentes

Boletín de Vigilancia Tecnológica

ENERO - FEBRERO 2023

SMART BUILDINGS
SMART CITIES
INDUSTRIA 4.0

Financiado por la Agencia Estatal de Investigación (PTR2020-001242)

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA E INNOVACIÓN

ÍNDICE

NOTICIAS

1. How to predict city traffic 2
2. Intelligent metasurface robotics could provide robot with the God’s eye vie... 2
3. Breakthrough in quantum computers set to solve major societal challenges 3
4. The 10 most innovative companies in robotics of 2023 3
5. Yes, we have enough materials to power the world with renewable energy 4

EMPRESAS Y MERCADOS

6. ABB predicts top robotics trends for 2023 5
7. Introducing LLaMA: A foundational, 65-billion-parameter large language mode... 5
8. Nvidia predicts AI models one million times more powerful than ChatGPT with... 6
9. OpenAI Used Kenyan Workers on Less Than $2 Per Hour to Make ChatGPT Less To... 6
10. The autonomous mover for everyone: world premiere of holon vehicle at ces 2... 7

PATENTES

11. Device for controlling a blocking device in a building 8
12. Method for granting access to a control unit in a building control system 8
13. Method of handling common channel monitoring for l1 based mobility 9
14. Methods and interfaces for home media control 9
15. A sensor system for a building 10
16. Designing export platform with improved blockchain and internet of things s... 10
17. Industrial automation smart object parent/child data collection propagation 10
18. Automated vehicle identification based on car-following data with machine l... 11
19. Method and apparatus for data scheduling in wireless communication system 12
20. Smart home message notification method and apparatus based on smart screen,... 12
21. Speech interpretation based on environmental context 13
22. Tool for facilitating efficiency in machine learning 13
23. Mobility systems and methods 14
24. Artificial intelligence and machine learning approaches in digital educatio... 14

ÍNDICE

25. Intelligent automated assistant in a home environment 15
26. Method for controlling the operation of a motorised drive device of a slidi... 15
27. Power line device and household appliance 16
28. Systems and methods for reactive projection-mapped show robot 16
29. Method and apparatus for transmitting and receiving hybrid automatic retran... 17
30. Methods and systems for controlling an electronic device in a smart home sy... 17
31. Networked electronic device with secondary wireless communication path for ... 18
32. Smart home system and method having plural user interface modes 18
33. Adaptable filtering for edge-based deep learning models 19

PUBLICACIONES CIENTÍFICAS

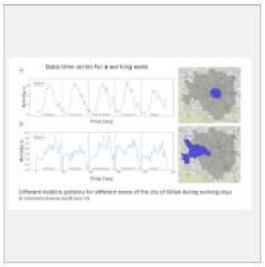
34. Automatic Scoring of Dream Reports' Emotional Content with Large Language M... 20
35. Decentralised construction of a global coordinate system in a large swarm o... 20
36. Dynamic Human Body Models in Vehicle Safety: An Overview 21
37. Learning to Control Autonomous Fleets from Observation via Offline Reinforc... 21
38. Multi-Agent Reinforcement Learning for Pragmatic Communication and Control 22
39. Vehicular Behavior-Aware Beamforming Design for Integrated Sensing and Comm... 22
40. Adaptive Control of IoT/M2M Devices in Smart Buildings using Heterogeneous ... 23
41. Cybersecurity Challenges of Power Transformers 23
42. COVERED, CollabOratiVE Robot Environment Dataset for 3D Semantic segmentati... 24
43. A Network Intrusion Detection System for Building Automation and Control Sy... 24
44. Smart Building Energy Management System for Energy Efficiency and Demand Re... 25
45. An Automated Vulnerability Detection Framework for Smart Contracts 25

NOTICIAS

How to predict city traffic

Publicada en https://www.eurekalert.org, 28/02/2023.

A new machine learning model can predict traffic activity in different zones of cities. To do so, a Complexity Science Hub researcher used data from a main car-sharing company in Italy as a proxy for overall city traffic. Understanding how different urban zones interact can help avoid traffic jams, for example, and enable targeted responses of policy makers - such as local expansion of public transportation.

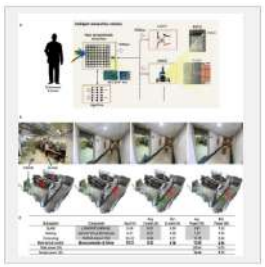


ver más...

Intelligent metasurface robotics could provide robot with the God's eye view in the human-robot alliance

Publicada en https://www.eurekalert.org, 28/02/2023.

This study is led by Professor Lianlin Li (Peking University, China), Professor Tie Jun Cui (Southeast University, China) and Professor Philipp del Hougne (Rennes University, France).

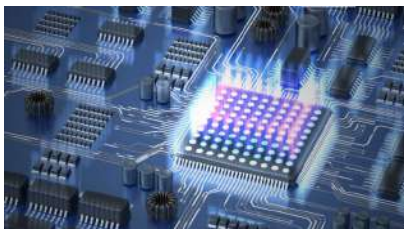


ver más...

Volver al índice

Breakthrough in quantum computers set to solve major societal challenges

Publicada en https://www.innovationnewsnetwork.com, 09/02/2023.

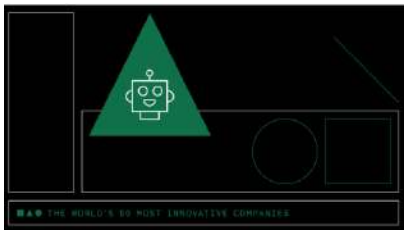


UK scientists have made a major breakthrough in developing practical quantum computers – connecting quantum microchips for the first time. For the first time, researchers from the University of Sussex and Universal Quantum have proved that quantum bits (qubits) can directly transfer between quantum computer microchips. This has been demonstrated with record-breaking speed and accuracy. The breakthrough is set to resolve a major challenge in building quantum computers large and powerful enough to tackle complex problems that are important to society.

ver más...

The 10 most innovative companies in robotics of 2023

Publicada en https://www.fastcompany.com, 03/02/2023.



Explore the full 2023 list of Fast Company’s Most Innovative Companies, 540 organizations that are reshaping industries and culture. We’ve selected the firms making the biggest impact across 54 categories, including artificial intelligence, augmented and virtual reality, gaming, and more.

ver más...

Volver al índice

Yes, we have enough materials to power the world with renewable energy

Publicada en https://www.technologyreview.com, 31/01/2023.

We won’t run out of key ingredients for climate action, but mining comes with social and environmental ramifications. Powering the world with renewable energy will take a lot of raw materials. The good news is, when it comes to aluminum, steel, and rare-earth metals, there’s plenty to go around, according to a new analysis.

ver más...

Volver al índice

EMPRESAS Y MERCADOS

ABB predicts top robotics trends for 2023

Publicada en https://new.abb.com, 27/02/2023.

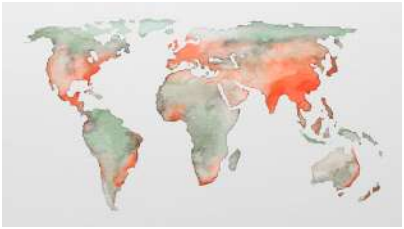
Labor shortages present new opportunities for robotic automation
AI and connected digital networks will make robots easier to use, enabling them to take on more tasks in new industries
More specialist partnerships between industry and educators will close robotics skills gap

ver más...

Introducing LLaMA: A foundational, 65-billion-parameter large language model

Publicada en https://ai.facebook.com, 24/02/2023.

As part of Meta's commitment to open science, today we are publicly releasing LLaMA (Large Language Model Meta AI), a state-of-the-art foundational large language model designed to help researchers advance their work in this subfield of AI. Smaller, more performant models such as LLaMA enable others in the research community who don't have access to large amounts of infrastructure to study these models, further democratizing access in this important, fast-changing field.



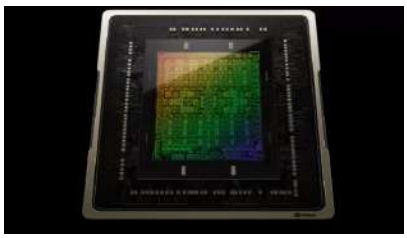
ver más...

Volver al índice

Nvidia predicts AI models one million times more powerful than ChatGPT within 10 years

Publicada en https://www.pcgamer.com, 24/02/2023.

A million here, times a million there. Pretty soon you're talking about big numbers. So Nvidia claims for its AI accelerating hardware in terms of the performance boost it has delivered over the last decade and will deliver again over the next 10 years.



ver más...

OpenAI Used Kenyan Workers on Less Than $2 Per Hour to Make ChatGPT Less Toxic

Publicada en https://time.com, 18/02/2023.

ChatGPT was hailed as one of 2022âs most impressive technological innovations upon its release last November. The powerful artificial intelligence (AI) chatbot can generate text on almost any topic or theme, from a Shakespearean sonnet reimagined in the style of Megan Thee Stallion, to complex mathematical theorems described in language a 5 year old can understand. Within a week, it had more than a million users

ver más...

Volver al índice

The autonomous mover for everyone: world premiere of holon vehicle at ces 2023

Publicada en https://www.benteler.com, 05/01/2023.

HOLON, the new brand from the BENTELER Group, will present its autonomous, fully electric and inclusive mover for the first time at the Consumer Electronics Show (CES) 2023 in Las Vegas. The vehicle is the world's first autonomous mover built to automotive standards – in other words, a leader in safety, ride comfort, and production quality. The HOLON mover operates autonomously and with a maximum speed of 60 km/h (37mph). It has a range of about 290 kilometers (180 miles).

ver más...

Volver al índice

PATENTES

Device for controlling a blocking device in a building

Publicada en Patentscope_Domótica, 22/02/2023.

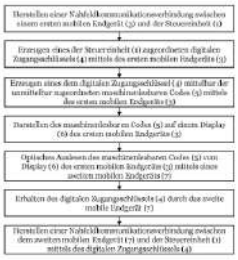
Solicitante: ABC VOLET
A device for controlling the motor of a closure or blocking device (10) in a building, comprising an electronic power supply circuit (5) for powering an electric motor (3) from an electrical power source (100) according to control commands (60), a main control circuit (6) associated with a first control signal receiver (61), a remote control (8) for generating and transmitting control signals (7).

ver más...

Method for granting access to a control unit in a building control system

Publicada en Patentscope_Domótica, 22/02/2023.

Solicitante: GIERSIEPEN GIRA GMBH
The invention relates to a method for granting an access right to a control unit in a building control system, comprising the steps: Establishing a near-field communication connection between a first mobile terminal and the control unit;Generating a digital access key assigned to the control unit using the first mobile terminal



ver más...

Volver al índice

Method of handling common channel monitoring for l1 based mobility

Publicada en Patentscope_Domótica, 22/02/2023.

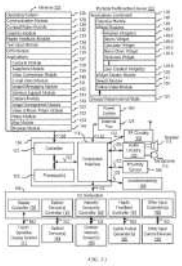
Solicitante: SAMSUNG ELECTRONICS CO LTD
A method performed by a user equipment (UE) in a wireless communication system is provided. The method includes receiving a physical downlink control channel (PDCCH) associated with a sidelink configured grant type 2, identifying whether a number of consecutive out-of-sync indications are received from lower layer,

ver más...

Methods and interfaces for home media control

Publicada en Patentscope_Domótica, 22/02/2023.

Solicitante: APPLE INC
The present disclosure generally relates to interfaces and techniques for media playback on one or more devices. In accordance with some embodiments, an electronic device includes a display, one or more processors, and memory.



ver más...

Volver al índice

A sensor system for a building

Publicada en Patentscope_Domótica, 15/02/2023.

Solicitante: METALLINE SMART BUILD LTD
A sensor system for a building, the sensor system comprising a plurality of sensor units and a processing unit wherein the sensor units each comprise a plurality of electronic components which are provided either directly or indirectly via a substrate, on a surface of an external component of the building, or embedded within an external component of the building

ver más...

Designing export platform with improved blockchain and internet of things structure

Publicada en Patentscope_Domótica, 15/02/2023.

Solicitante: ATEZ YAZILIM TEKNOLOJILERI A S
The present invention relates to a secure and easy-to-use trading platform that is utilizable within the structure of blockchain technology, in which data verified via the Internet of Things are encoded with smart contracts.

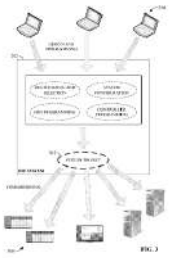
ver más...

Volver al índice

Industrial automation smart object parent/child data collection propagation

Publicada en Patentscope_Domótica, 15/02/2023.

Solicitante: ROCKWELL AUTOMATION TECH INC
An industrial integrated development environment (IDE) provides a development framework for designing, programming, and configuring multiple aspects of an industrial automation system using a common design environment and data model.

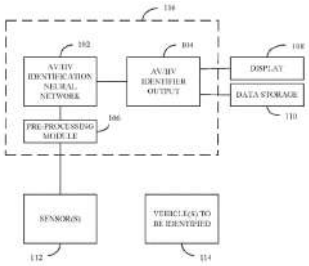


ver más...

Automated vehicle identification based on car-following data with machine learning

Publicada en Patentes AI patentscope, 09/02/2023.

Solicitante: University of South Florida
A system for identifying autonomous vehicles includes at least one sensor that may be configured to provide sensor data associated with at least two vehicles. A pre-processing module may be coupled to the at least one sensor and may be configured to determine a set of data including at least car following data based on the sensor data. An autonomous vehicle (AV)/human-driven vehicle (HV) identification neural network may be coupled to the pre-processing module and configured to generate an AV/HV identifier for at least one of the at least two vehicles based on at least the car following data during a predetermined time period.



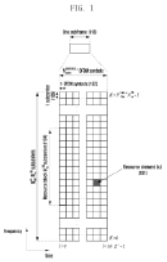
ver más...

Volver al índice

Method and apparatus for data scheduling in wireless communication system

Publicada en Patentscope_Domótica, 08/02/2023.

Solicitante: SAMSUNG ELECTRONICS CO LTD
The present disclosure relates to: a communication technique for combining an IoT technology with a 5th generation (5G) or pre-5G communication system for supporting a higher data transmission rate than a 4th generation (4G) communication system such as long term evolution (LTE)



ver más...

Smart home message notification method and apparatus based on smart screen, and smart screen

Publicada en Patentscope_Domótica, 08/02/2023.

Solicitante: SHENZHEN SKYWORTH RGB ELECTRONICS CO LTD
Disclosed in the embodiments of the present disclosure are a method for notifying a message of a smart home based on a smart screen, an apparatus, and a smart screen. The method includes: receiving a notification message sent by a smart home device waiting to be processed by a user; determining, by means of a communication component of a smart screen

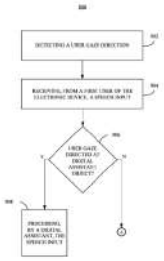
ver más...

Volver al índice

Speech interpretation based on environmental context

Publicada en https://patentscope.wipo.int/, 02/02/2023.

Solicitante: Apple
Systems and processes for speech interpretation based on environmental context are provided. For example, a user gaze direction is detected, and a speech input is received from a first user of the electronic device. In accordance with a determination that the user gaze is directed at a digital assistant object, the speech input is processed by the digital assistant.

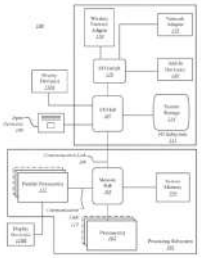


ver más...

Tool for facilitating efficiency in machine learning

Publicada en Patentes AI patentscope, 19/01/2023.

Solicitante: Intel Corporation
A mechanism is described for facilitating smart distribution of resources for deep learning autonomous machines. A method of embodiments, as described herein, includes detecting one or more sets of data from one or more sources over one or more networks, and introducing a library to a neural network application to determine optimal point at which to apply frequency scaling without degrading performance of the neural network application at a computing device.



ver más...

Volver al índice

Mobility systems and methods

Publicada en Patentscope_Domótica, 18/01/2023.

Solicitante: ALTIMATE MEDICAL INC
Described herein are various improvements to mobility devices. These improvements include, for example, adjustable lateral body supports, multi axial supports for accommodating movement of the pelvis during walking, frame folding assemblies for accommodating storage and transportation

ver más...

Artificial intelligence and machine learning approaches in digital education: a systematic approach

Publicada en Patentes AI patentscope, 13/01/2023.

Solicitantes: Santiago Otero-Potosi et al.
The use of artificial intelligence and machine learning techniques across all disciplines has exploded in the past few years, with the ever-growing size of data and the changing needs of higher education, such as digital education. Similarly, online educational information systems have a huge amount of data related to students in digital education. This educational data can be used with artificial intelligence and machine learning techniques to improve digital education. This study makes two main contributions. First, the study follows a repeatable and objective process of exploring the literature. Second, the study outlines and explains the literature's themes related to the use of AI-based algorithms in digital education. The study findings present six themes related to the use of machines in digital education. The synthesized evidence in this study suggests that machine learning and deep learning algorithms are used in several themes of digital learning.

ver más...

Volver al índice

Intelligent automated assistant in a home environment

Publicada en Patentscope_Domótica, 11/01/2023.

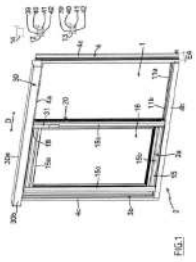
Solicitante: APPLE INC
Systems and processes for operating an intelligent automated assistant are provided. In one example process, discourse input representing a user request can be received. The process can determine one or more possible device characteristics corresponding to the discourse input. Data structure representing a set of devices of an established location can be retrieved.

ver más...

Method for controlling the operation of a motorised drive device of a sliding window for a building, associated window and home automation installation

Publicada en Patentscope_Domótica, 11/01/2023.

Solicitante: SOMFY ACTIVITES SA
Un procédé de commande en fonctionnement d'un dispositif d'entraînement motorisé d'une fenêtre coulissante pour un bâtiment comprend une étape de commande (E20) d'un moteur électrique, de sorte à déplacer un ouvrant par rapport à un cadre dormant. Lors de l'étape de commande (E20), le procédé comprend une étape de mesure (E30) de valeurs d'intensité du courant électrique traversant le moteur électrique et une étape de détermination (E40) de l'atteinte d'une position fermée et verrouillée



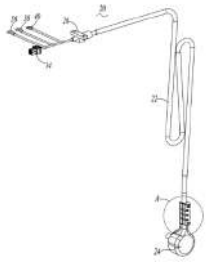
ver más...

Volver al índice

Power line device and household appliance

Publicada en Patentscope_Domótica, 11/01/2023.

Solicitantes: QINGDAO HAIER REFRIGERATOR CO LTD, HAIER SMART HOME CO LTD
The present invention provides a power supply line device and a household appliance. The power supply line device is used to power the household appliance. The power supply line device comprises a line body, a plug disposed at one end of the line body



ver más...

Systems and methods for reactive projection-mapped show robot

Publicada en Patentscope_Domótica, 11/01/2023.

Solicitante: UNIVERSAL CITY STUDIOS LLC
An amusement attraction provides a reactive game experience to a guest. The amusement attraction includes a robot control system having a show robot and a robot controller communicatively coupled to the show robot. The robot controller is configured to instruct the show robot to execute a baseline performance, which is predetermined and stored within the robot controller.

ver más...

Volver al índice

Method and apparatus for transmitting and receiving hybrid automatic retransmission request acknowledgement information in a wireless communication system

Publicada en Patentscope_Domótica, 04/01/2023.

Solicitante: SAMSUNG ELECTRONICS CO LTD
The present disclosure relates to a communication method and system for converging a 5th-Generation (5G) communication system for supporting higher data rates beyond a 4th-Generation (4G) system with a technology for Internet of Things (IoT). The present disclosure may be applied to intelligent services based on the 5G communication technology and the IoT-related technology, such as smart home

ver más...

Methods and systems for controlling an electronic device in a smart home system

Publicada en Patentscope_Domótica, 04/01/2023.

Solicitante: INTER IKEA SYS BV
A computer implemented method (100) in a smart home system is provided. The method (100) comprises defining, by sensing an indoor position (10) of a wearable electronic device (12) comprising an indoor positioning module, an area (14) in a real-world indoor environment, and attributing a rule to the defined area

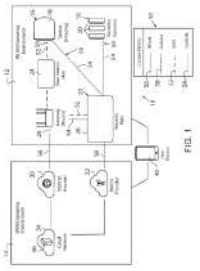
ver más...

Volver al índice

Networked electronic device with secondary wireless communication path for primary network setup

Publicada en Patentscope_Domótica, 04/01/2023.

Solicitante: ARLO TECH INC
An electronic monitoring system is provided that implements at least two communication paths using primary and secondary radios for facilitating self-installation or setup of electronic devices such as monitoring devices and/or various smart home devices using one of the communication paths to transmit various network and other credentials.

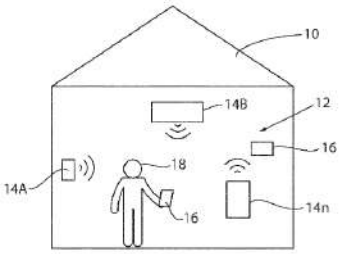


ver más...

Smart home system and method having plural user interface modes

Publicada en Patentscope_Domótica, 04/01/2023.

Solicitante: ARLO TECH INC
A smart home system such a smart security system includes at least one controlled module capable of performing monitoring and/or control functions, and a controller that is in communication with the controlled module and a user device such as a smart phone or computer tablet.

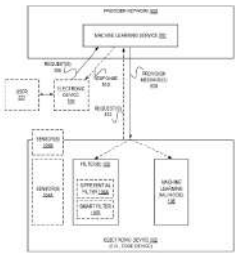


ver más...

Volver al índice

Adaptable filtering for edge-based deep learning models

Publicada en Patentes AI patentscope, 03/01/2023.



Solicitante: Amazon Technologies, Inc.
Techniques for utilizing adaptable filters for edge-based deep learning models are described. Filters may be utilized by an edge electronic device to filter elements of an input data stream so that only a subset of the elements are used as inputs to a machine learning model run by the electronic device, enabling successful operation despite the input data stream potentially being generated at a higher rate than a rate in which the ML model can be executed. The filter can be a differential-type filter that generates difference representations between consecutive elements of the data stream to determine which elements are to be passed on for the ML model, a “smart” filter such as a neural network trained using outputs from the ML model allowing the filter to “learn” which elements are the most likely to be of value to be passed on, or a combination of both.

ver más...

Volver al índice

PUBLICACIONES CIENTÍFICAS

Automatic Scoring of Dream Reports' Emotional Content with Large Language Models

Publicada en https://arxiv.org, 28/02/2023.

In the field of dream research, the study of dream content typically relies on the analysis of verbal reports provided by dreamers upon awakening from their sleep. This task is classically performed through manual scoring provided by trained annotators, at a great time expense.

ver más...

Decentralised construction of a global coordinate system in a large swarm of minimalistic robots

Publicada en https://arxiv.org, 28/02/2023.

Collective intelligence and autonomy of robot swarms can be improved by enabling the individual robots to become aware they are the constituent units of a larger whole and what is their role. In this study, we present an algorithm to enable positional self-awareness in a swarm of minimalistic error-prone robots which can only locally broadcast messages and estimate the distance from their neighbours.

ver más...

Volver al índice

Dynamic Human Body Models in Vehicle Safety: An Overview

Publicada en https://arxiv.org, 28/02/2023.

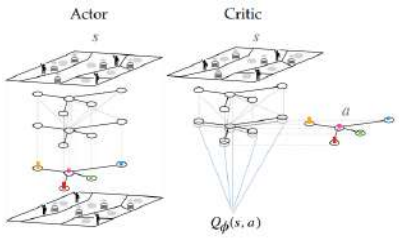
Significant trends in the vehicle industry are autonomous driving, micromobility, electrification and the increased use of shared mobility solutions. These new vehicle automation and mobility classes lead to a larger number of occupant positions, interiors and load directions. As safety systems interact with and protect occupants, it is essential to place the human, with its variability and vulnerability, at the center of the design and operation of these systems.

ver más...

Learning to Control Autonomous Fleets from Observation via Offline Reinforcement Learning

Publicada en https://arxiv.org, 28/02/2023.

Autonomous Mobility-on-Demand (AMoD) systems are a rapidly evolving mode of transportation in which a centrally coordinated fleet of self-driving vehicles dynamically serves travel requests. The control of these systems is typically formulated as a large network optimization problem, and reinforcement learning (RL) has recently emerged as a promising approach to solve the open challenges in this space.



ver más...

Volver al índice

Multi-Agent Reinforcement Learning for Pragmatic Communication and Control

Publicada en https://arxiv.org, 28/02/2023.

The automation of factories and manufacturing processes has been accelerating over the past few years, boosted by the Industry 4.0 paradigm, including diverse scenarios with mobile, flexible agents. Efficient coordination between mobile robots requires reliable wireless transmission in highly dynamic environments, often with strict timing requirements.

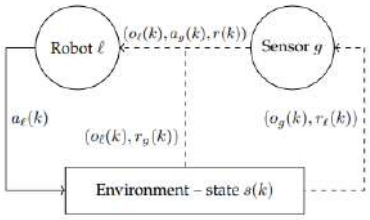


Fig. 1: Simple CP-POMDP model with two agents.

ver más...

Vehicular Behavior-Aware Beamforming Design for Integrated Sensing and Communication Systems

Publicada en https://arxiv.org, 27/02/2023.

Communication and sensing are two important features of connected and autonomous vehicles (CAVs). In traditional vehicle-mounted devices, communication and sensing modules exist but in an isolated way, resulting in a waste of hardware resources and wireless spectrum. In this paper, to cope with the above inefficiency

ver más...

Volver al índice

Adaptive Control of IoT/M2M Devices in Smart Buildings using Heterogeneous Wireless Networks

Publicada en https://arxiv.org, 26/02/2023.

With the rapid development of wireless communication technology, the Internet of Things (IoT) and Machine-to-Machine (M2M) are becoming essential for many applications. One of the most emblematic IoT/M2M applications is smart buildings. The current Building Automation Systems (BAS) are limited by many factors, including the lack of integration of IoT and M2M technologies, unfriendly user interfacing, and the lack of a convergent solution.

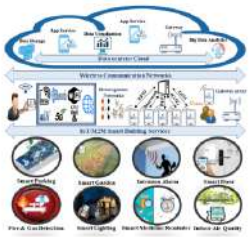


Figure 1: IoT/M2M smart building architecture.

ver más...

Cybersecurity Challenges of Power Transformers

Publicada en https://arxiv.org, 25/02/2023.

The rise of cyber threats on critical infrastructure and its potential for devastating consequences, has significantly increased. The dependency of new power grid technology on information, data analytic and communication systems make the entire electricity network vulnerable to cyber threats.

ver más...

Volver al índice

COVERED, CollabOratiVE Robot Environment Dataset for 3D Semantic segmentation

Publicada en https://arxiv.org, 23/02/2023.

Safe human-robot collaboration (HRC) has recently gained a lot of interest with the emerging Industry 5.0 paradigm. Conventional robots are being replaced with more intelligent and flexible collaborative robots (cobots). Safe and efficient collaboration between cobots and humans largely relies on the cobot's comprehensive semantic understanding of the dynamic surrounding of industrial environments.

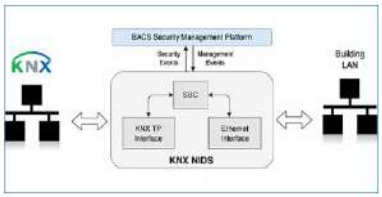
(a) Semantically-segmented Point cloud (b) Dynamic Collaborative area
Fig. 1: Collaborative robotic workspace at IMS, ZHAW.

ver más...

A Network Intrusion Detection System for Building Automation and Control Systems

Publicada en https://ieeexplore.ieee.org, 23/01/2023.

Building Automation and Control Systems (BACS) are traditionally based on specialized communications protocols, such as KNX or BACnet, and dedicated sensing and actuating devices. Despite the increased awareness about the security risks associated with BACS, there is a lack of security tools for protecting this special breed of cyber-physical systems



KNX Network IDS Operation Concept

ver más...

Volver al índice

Smart Building Energy Management System for Energy Efficiency and Demand Response

Publicada en https://vtechworks.lib.vt.edu, 13/01/2023.

Buildings account for a significant share of total energy use throughout the world. Religious facilities, which account for a substantial portion of overall floor space and energy use in the commercial sector, have rarely been the subject of energy efficiency and management studies. Religious buildings have distinct patterns of occupancy and energy consumption.

ver más...

An Automated Vulnerability Detection Framework for Smart Contracts

Publicada en https://arxiv.org, 10/01/2023.

With the increase of the adoption of blockchain technology in providing decentralized solutions to various problems, smart contracts have become more popular to the point that billions of US Dollars are currently exchanged every day through such technology.

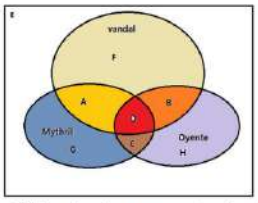


Figure 7: The number of smart contracts in each regions are Rectangle:160012, A:28074, B:10194, C:907, D:3789, E:32735, F:73699, G:6309, H:4308

ver más...

Volver al índice