



# SmartLivingPlat

Plataforma Tecnológica de la Domótica  
y las Ciudades Inteligentes



## Boletín de Vigilancia Tecnológica

ENERO - FEBRERO 2024

SMART BUILDINGS  
SMART CITIES  
INDUSTRIA 4.0

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# NOTICIAS

## New chip opens door to AI computing at light speed

Publicada en penntoday.upenn.edu, 21/02/2024

A new silicon-photonic (SiPh) chip design from the lab of Nader Engheta, alongside Firooz Aflatouni, uses light waves, the fastest possible means of communication, rather than electricity, to perform mathematical computations. Penn engineers have developed a new chip that uses light waves, rather than electricity, to perform the complex math essential to training AI.

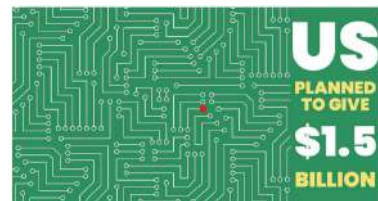


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## U.S. to give 1.5 billion USD for computer-chip plant, heating up global race

Publicada en thesiliconreview.com, 21/02/2024

In a bid to bolster the nation's capacity for semiconductor production, the Biden administration has revealed plans to allocate 1,5 billion USD toward the construction of a significant new computer chip factory in New York State.



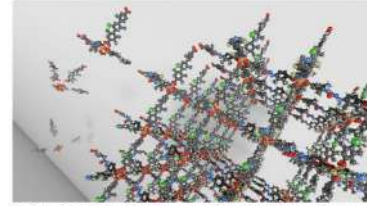
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## Using AI to develop eco-friendly materials for carbon capture

Publicada en techexplorist.com, 12/02/2024

Metal-organic framework (MOF) materials can be used in many different applications. Carbon capture technology can help reduce greenhouse gas emissions from power plants and other industrial facilities. However, finding a suitable material that can do this efficiently and affordably is still an open problem. Metal-organic frameworks (MOFs) could be a viable solution.

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Scientific visualization of the 3D-pore structure of a metal-organic framework (MOF) with high surface area, porous structure, and tunable properties. Credit: Huali Tang, University of Illinois at Chicago, and the MIT/UC Berkeley team.

## Investigadores malasios han demostrado que el uso de reflectores puede ser rentable aumentando la eficiencia energética de los paneles solares

Publicada en ecoinventos.com, 15/01/2024

Un equipo de la Universidad Multimedia de Malasia se ha centrado en la evaluación de la viabilidad económica de incorporar reflectores de espejo en sistemas fotovoltaicos. A través de un estudio detallado, los investigadores malasios han demostrado que el uso de reflectores puede ser económicamente factible en las condiciones climáticas específicas de Malasia, ofreciendo un incremento significativo en la eficiencia energética de los módulos solares.

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## How I built a fully offline smart home, and why you should too

Publicada en [androidauthority.com](https://androidauthority.com), 6/01/2024

As someone who grew up with a dial-up internet connection, I get anxious at the thought of any always-online product or service. My smart home is no different — I rely on it to automatically cool the room when I return home, light up my closet when I open the door, and match the color temperature of my lights to the sun's position. Why should any of that require an internet connection? That train of thought is exactly what led me to build a fully offline smart home that doesn't hinge on any third-party servers whatsoever. And here's how you can do it, too.

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# EMPRESAS Y MERCADOS

## Nvidia's boom and Intel's big plans show how AI has turbocharged chipmaking

Publicada en axios.com, 22/02/2024

AI makers' desperate need for millions of powerful chips took center stage on Wednesday as the world's most valuable chipmaker, Nvidia, reported another quarter of massive revenue growth and longtime leader Intel reported progress on reinvigorating its manufacturing operation. Why it matters: Nvidia's fortunes have soared along with demand for its chips to train and run AI systems — but the rest of the semiconductor industry stands to get a major boost from AI, too.

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## Nvidia posts revenue up 265% on booming AI business

Publicada en <https://www.cnn.com>, 21/02/2024

Nvidia reported earnings after the bell that beat Wall Street expectations for earnings and sales, and said revenue during the current quarter would be better than expected. Nvidia has been the primary beneficiary of the recent technology industry obsession with large artificial intelligence models, which are developed on the company's pricey graphics processors for servers.

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## Walmart Agrees To Acquire VIZIO HOLDING CORP. To Facilitate Accelerated Growth of Walmart Connect through VIZIO's SmartCast Operating System

Publicada en <https://corporate.walmart.com>, 20/02/2024

Today, Walmart and VIZIO announced they have entered into an agreement for Walmart to acquire VIZIO for \$11.50 per share in cash, equating to a fully diluted equity value of approximately \$2.3 billion.

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## OpenAI Can Now Turn Words Into Ultra-Realistic Videos

Publicada en [cnet.com](https://www.cnet.com), 19/02/2024

For now, availability is limited to experts and creatives. Meanwhile, ElevenLabs is working on AI-generated sound effects. AI startup OpenAI has unveiled a text-to-video model, called Sora, that could raise the bar for what's possible in generative AI. Like Google's text-to-video tool Lumiere, Sora's availability is limited. Unlike Lumiere, Sora can generate videos up to 1 minute long.

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## China's top 10 semiconductor firms

Publicada en [thechinaproject.com](https://thechinaproject.com), 03/02/2024

China's chip industry has been juiced by funding from the government and jinxed by U.S. export curbs on advanced equipment. But the century of chip rivalry has just started. These are ten Chinese semiconductor firms to look out for and three that went down in flames. The global semiconductor industry is valued at over half a trillion U.S. dollars, and its products

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## HPE to acquire Juniper Networks to accelerate AI-driven innovation

Publicada en <https://www.hpe.com>, 09/01/2024

Highly complementary combination enhances secure, unified, cloud and AI-native networking to drive innovation from edge to cloud to exascale. Accelerates long-term revenue growth and expands gross and operating margin; Expected to be accretive to non-GAAP EPS and free cash flow in year 1, post close. Advances HPE's portfolio mix shift toward higher-growth solutions and strengthens high-margin networking business

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## The future of LiDAR is 4D, using Frequency-Modulated Continuous Wave technology.

Publicada en <https://openlightphotonics.com>, 01/01/2024

Current LiDAR technology measures the laser signal's 'time of flight' to establish location and distance. Frequency-modulated continuous wave (FMCW) LiDAR does this too, however, by working more like radar, it measures the Doppler shift of the signal's frequency, to establish velocity. The FMCW signal is transmitted coherently and received coherently, giving it a longer range. The resulting LiDAR device is more effective in adverse weather conditions, such as fog, mist, rain, and glare, as well as being less susceptible to interference from other LiDAR systems.

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## Oxford claims the world record for solar panel efficiency

Publicada en [electrek.co](http://electrek.co), 30/01/2024

Oxford PV, a spin-off from the University of Oxford, says it's achieved the world record for the most efficient solar panel. In collaboration with Germany's Fraunhofer Institute for Solar Energy Systems, the company says its solar panel achieved 25% conversion efficiency – the percentage of solar energy shining on a panel converted into electricity. That's a big deal compared to the more typical 16-24% in commercial solar panels.

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# PATENTES

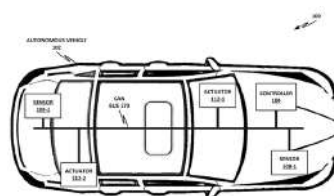
## Automated Inference Of A Customer Support Request In An Autonomous Vehicle

Publicada en Patentscope, 22/02/2024

Solicitante: GM Cruise Holdings LLC

A method of providing an onboard assistant for a vehicle, comprising: receiving sensor data from sensors of the vehicle; transforming the sensor data using a trained machine learning model to provide transformed sensor data; inferring from the transformed sensor data that

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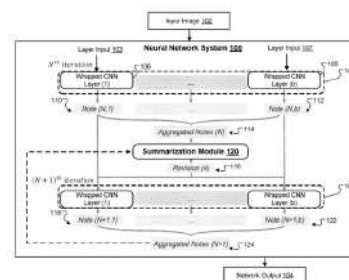
## Computer Vision Models Using Global And Local Information

Publicada en Patentscope, 22/02/2024

Solicitante: Google LLC

A system including a computer vision model configured to perform a machine learning task is described. The computer vision model includes multiple wrapped convolutional layers, in which each wrapped convolutional layer includes a respective convolutional layer configured to receive...

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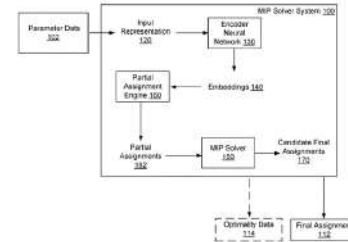
# Solving Mixed Integer Programs Using Neural Networks

Publicada en Patentscope, 22/02/2024

Solicitante: DeepMind Technologies Limited

Methods, systems, and apparatus, including computer programs encoded on computer storage media, for solving mixed integer programs (MIPs) using neural networks. One of the methods includes obtaining data specifying parameters of a MIP; generating, from the parameters of the MIP

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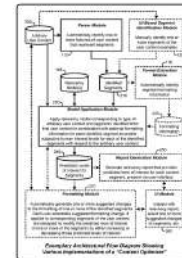
# Automated Comprehension And Interest-Based Optimization Of Content

Publicada en Patentscope, 22/02/2024

Solicitante: Microsoft Technology Licensing, LLC

A “Content Optimizer” applies a machine-learned relevancy model to predict levels of interest for segments of arbitrary content. Arbitrary content includes, but is not limited to, any combination of documents including text, charts, images, speech, etc. Various automated reports and

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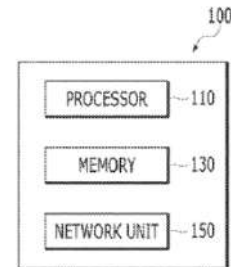
## Method For Classification Using Deep Learning Model

Publicada en Patentscope, 22/02/2024

Solicitante: Vuno Inc [KR]

According to an exemplary embodiment of the present disclosure, a method for classification by using a deep learning model, the method being performed by a computing device, is disclosed. The method may include: extracting a feature vector interpretable based on domain

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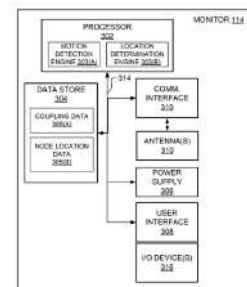
## WiFi Motion Detecting for Smart Home Device Control

Publicada en Patentscope, 22/02/2024

Solicitante: DISH Network L.L.C.

A process for detecting motion within an environment includes receiving, at a monitor, first coupling data for a coupling of a first node with a second node. The first node is coupled to the second node which is further coupled to

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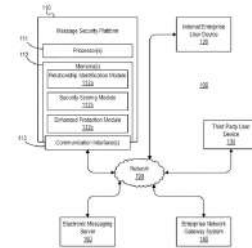
# Dynamic Message Analysis Platform for Enhanced Enterprise Security

Publicada en Patentscope, 22/02/2024

Solicitante: Proofpoint, Inc.

Aspects of the disclosure relate to dynamic message analysis using machine learning. A computing platform may monitor a messaging server associated with an enterprise organization. Based on monitoring the messaging server, the computing platform may identify bi-directional messaging traffic between

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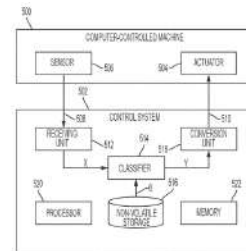
# Systems And Methods For Assessing Emissions Calibration Projects With Hybrid Artificial Intelligence Based Support

Publicada en Patentscope, 22/02/2024

Solicitante: Robert Bosch GmbH

A method includes receiving a first set of characteristics associated with an engine emissions calibration project and identifying, in a knowledge graph corresponding to engine emissions calibration, a second set of characteristics that corresponds to the first set of characteristics. The

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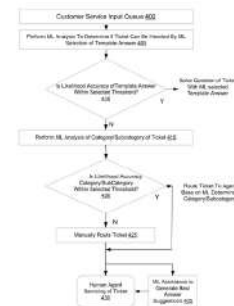
# Granular Taxonomy For Customer Support Augmented With AI

Publicada en Patentscope, 22/02/2024

Solicitante: Forethought Technologies, Inc.

A computer-implemented method for augmenting customer support is disclosed in which a granular taxonomy is formed to classify tickets based on customer issue topic. A dashboard and user interface of performance metrics may be generated for the topics in the

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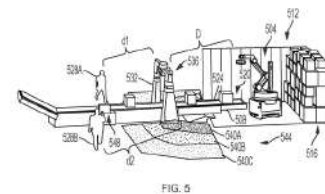
# Systems And Methods Of Guarding A Mobile Robot

Publicada en Patentscope, 22/02/2024

Solicitante: BOSTON DYNAMICS, INC. [US]

A computing device receives location information for a mobile robot. The computing device also receives location information for an entity in an environment of the mobile robot. The computing device determines a distance between the mobile robot and the entity in 2024-02-22

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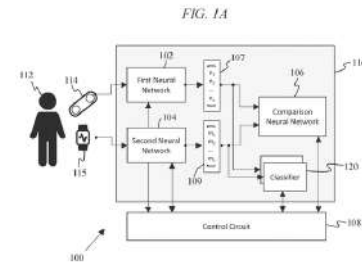
# System And Method For Human Activity Recognition

Publicada en Patentscope, 22/02/2024

Solicitante: PHYSIQ INC. [US]

In aspects, the present approaches allow neural networks to be taught to understand patterns of human behavior without the need of expert data labeling or laboratory studies. First and second neural networks are trained to understand these patterns without labeling. Once

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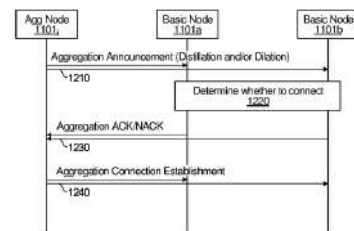
# Methods And Apparatuses For Configuring Topology For Artificial Intelligence Or Machine Learning

Publicada en Patentscope, 22/02/2024

Solicitante: Huawei

Aspects of the present disclosure provide methods and apparatuses for configuring a topology for artificial intelligence or machine learning (AI/ML) in a wireless communication network to resolve problems, such as data heterogeneity, in conventional federated learning-based training processes.

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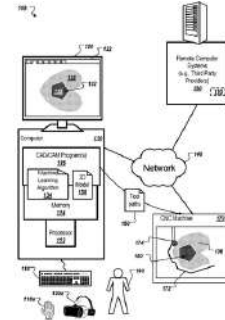
# Toolpath Generation By Reinforcement Learning For Computer Aided Manufacturing

Publicada en Patentscope, 22/02/2024

Solicitante: Autodesk, Inc.

Methods, systems, and apparatus, including medium-encoded computer program products, for computer aided design and manufacture of physical structures using toolpaths generated by reinforcement learning for use with subtractive manufacturing systems and techniques, include: obtaining, in a computer aided design or...

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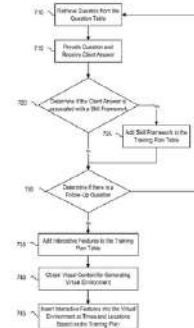
# Intelligent Authoring For Virtual Reality

Publicada en Patentscope, 22/02/2024

Solicitante: STRIVR Labs, Inc.

Techniques are provided for creating a virtual environment that can be used for virtual trainings. The virtual environment is configured so that the environment can be viewed using a head-mounted display. A computer system can receive a learning objective from

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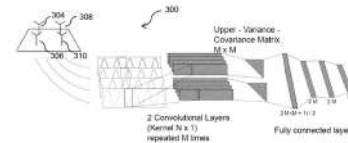
# Methods, Devices, And Systems For Blind Adaptive Beamforming Of Narrowband Signals With An Uncalibrated Antenna Array Using Machine Learning

Publicada en Patentscope, 22/02/2024

Solicitante: JuliaHub, Inc.

Disclosed herein are systems and methods for blind adaptive beamforming narrowband signals with an uncalibrated antenna array using machine learning. A machine-learning model in the spatial domain enhances the signal of interest and mitigates interfering signals. The systems and methods

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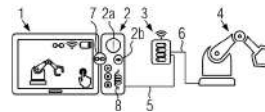
# System For Controlling Operation Of An Automation Component

Publicada en Patentscope, 22/02/2024

Solicitante: FRUITCORE ROBOTICS GMBH [DE]

The present invention relates to a system for controlling operation of at least one automation component, wherein the system comprises a mobile device configured for receiving a user's input and transmitting a control signal to a controller of the at...

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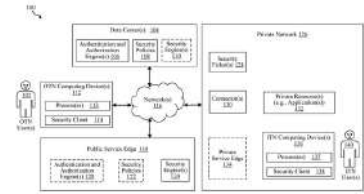
# Intelligent Secure User Access To Private Resources

Publicada en Patentscope, 22/02/2024

Solicitante: MICROSOFT TECHNOLOGY LICENSING, LLC [US]

Methods, systems and computer program products are provided for intelligent secure access to private resources. A security service (e.g., SASE ZTNA) may maintain the same or similar security posture for users who work remotely and/or locally by providing authentication

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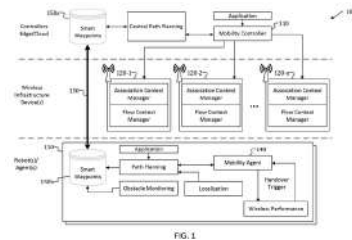
# System For Path-Aware Mobility Management And Mobility-Management-Aware Path Planning For Robots

Publicada en Patentscope, 22/02/2024

Solicitante: INTEL CORPORATION [US]

Disclosed herein are systems, methods, and devices for providing mobility management and path planning with an interface between the mobility management functions and path planning functions. A mobility controller may receive an expected location into which a robot plans to move

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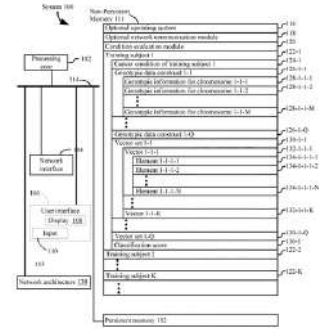
# Convolutional Neural Network Systems And Methods For Data Classification

Publicada en Patentscope, 22/02/2024

Solicitante: GRAIL, LLC

Classification of cancer condition, in a plurality of different cancer conditions, for a species, is provided in which, for each training subject in a plurality of training subjects, there is obtained a cancer condition and a genotypic data construct including genotypical

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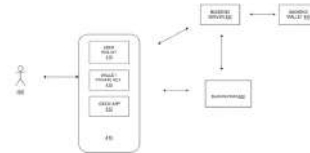
# Eliminating The Race Condition And Infinite Approval Loophole For Smart Contracts And Other Blockchain Transactions

Publicada en Patentscope, 22/02/2024

Solicitante: DefiQ, Inc.

A method for executing a transaction on a blockchain or other distributed ledger that protects the user from other blockchain users attempting to front run or rerun an approved transaction. A backend server searches the blockchain for existing transactions that use

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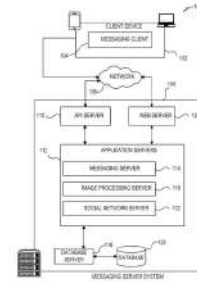
# Generating Ground Truths for Machine Learning

Publicada en Patentscope, 22/02/2024

Solicitante: Snap Inc

A messaging system processes three-dimensional (3D) models to generate ground truths for training machine learning models for applications of the messaging system. A method of generating ground truths for machine learning includes generating a plurality of first rendered images from 2024-02-22

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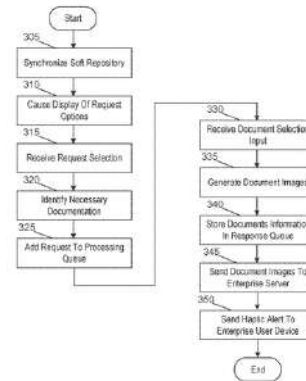
# Hybrid Metaverse Using Edge Nodes To Support A Soft Repository For Event Processing

Publicada en Patentscope, 22/02/2024

Solicitante: Bank of America Corporation

Aspects of the disclosure relate to a hybrid metaverse environment. A computing platform may synchronize, using edge nodes and with a physical repository server, a soft document repository. The computing platform may receive, via a metaverse application interface, an event processing

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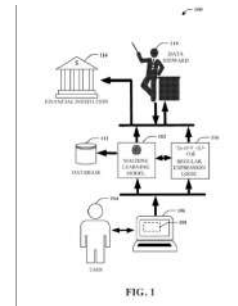
## Identifying Sensitive Data using Redacted Data

Publicada en Patentscope, 22/02/2024

Solicitante: Capital One Services, LLC

Disclosed embodiments pertain to identifying sensitive data using redacted data. Data entry into electronic form fields can be monitored and analyzed to detect improperly entered sensitive data. The type of sensitive data can be determined, and the sensitive data can be...

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## Prefetching Weights For Use In A Neural Network Processor

Publicada en Patentscope, 22/02/2024

Solicitante: Google LLC

A circuit for performing neural network computations for a neural network, the circuit comprising: a systolic array comprising a plurality of cells; a weight fetcher unit configured to, for each of the plurality of neural network layers: send, for the neural...

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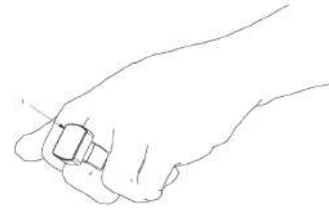
## Smart Wearable Device

Publicada en Patentscope, 22/02/2024

Solicitante: SURGE SPORTSTECH, INC.

A smart wearable device may include a smart ring device. The smart ring device may include a ring that includes a coupling mount. The smart ring device may also include an electronics unit selectively attachable to the coupling mount.

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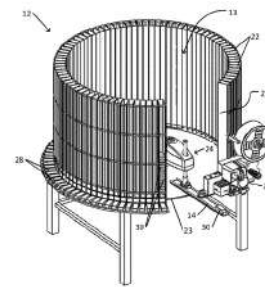
## Product Selection System

Publicada en Patentscope, 22/02/2024

Solicitante: Aquabot Ltd.

A product selection system includes a robotic arm that is controllable to grip and manipulate product items of different types that are stored in a plurality of storage units that at least partially surround a central space in which the robotic...

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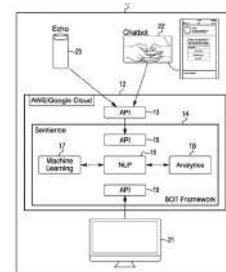
## System Using Natural Conversation For Monitoring A Facility

Publicada en Patentscope, 22/02/2024

Solicitante: Honeywell International Inc.

A self-guided robot (bot) mechanism. An example bot may have a channel having an input for users, a cloud platform connected to the channel, a bot framework connected to the cloud platform, a web services module connected to the cloud platform, a bot framework connected to the cloud platform, a web services module connected to the bot...

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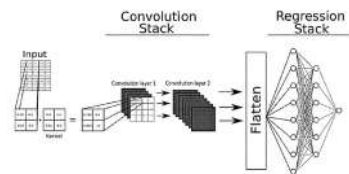
## Methods For Prediction Of Neutronics Parameters Using Deep Learning

Publicada en Patentscope, 22/02/2024

Solicitante: Cole GENTRY, University of Florida Research Foundation, Inc.

Various examples are related to prediction of neutronics parameters using deep learning. In one embodiment, a method includes generating a training data set based upon one or more principled approaches that provide a gradient of values; generating a neural network using...

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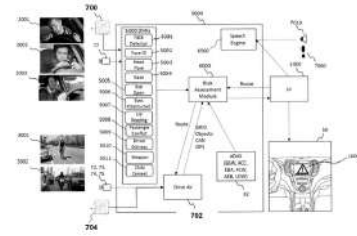
## Gaze Detection Using One Or More Neural Networks

Publicada en Patentscope, 22/02/2024

Solicitante: Nvidia Corporation

Apparatuses, systems, and techniques are described to determine locations of objects using images including digital representations of those objects. In at least one embodiment, a gaze of one or more occupants of a vehicle is determined independently of a location of...

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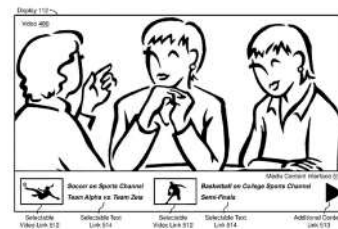
## Intelligent Automated Assistant For Tv User Interactions

Publicada en Patentscope, 22/02/2024

Solicitante: Apple Inc.

Systems and processes are disclosed for controlling television user interactions using a virtual assistant. In an example process, a virtual assistant can interact with a television set-top box to control content shown on a television display. Speech input for the...

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# Neural-Network Post-Filter Purposes With Downsampling Capabilities

Publicada en Patentscope, 22/02/2024

Solicitante: BYTEDANCE INC. [US]

A method for processing media data is disclosed. In an embodiment, the method includes determining a value of a neural-network post-filter characteristics (NNPF) purpose (nnpfc\_purpose) in a NNPF supplemental enhancement information (SEI) message, wherein the nnpfc\_purpose is configured to be set to include output picture size downsampling, and wherein at least one of (1) an output picture width is not equal to an input picture width and (2) an output picture height is not equal to an input picture height.

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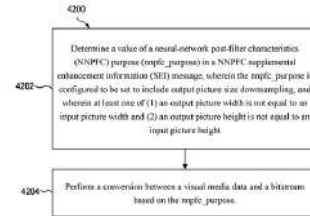


FIG. 4

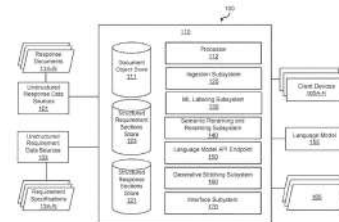
# Computer-Generated Content Based On Text Classification, Semantic Relevance, And Activation Of Deep Learning Large Language Models

Publicada en Patentscope, 22/02/2024

Solicitante: ROHIRRIM, INC.

The disclosure relates to systems and methods of automatically generating unique content including natural language text based on a corpus of previously generated response documents and discrete requirements defined in a requirements specification. The system may use generative stitching that includes 2024-02-22

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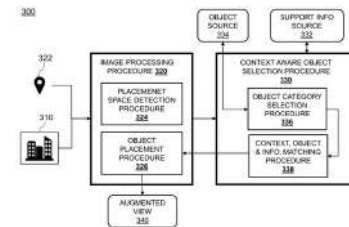
# System And Method For Contextualized Selection Of Objects For Placement In Mixed Reality

Publicada en Patentscope, 22/02/2024

Solicitante: Urbanoid Inc.

A system and method is provided for contextualizing and selecting objects for placement in digital environments, specifically, in mixed reality (MR) environments. The proposed systems and methods embed personalized and customized content in the user's view of the physical environment

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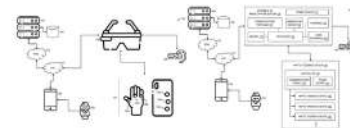
# Converting Spatial Information To Haptic And Auditory Feedback

Publicada en Patentscope, 22/02/2024

Solicitante: Arizona Board of Regents on Behalf of the University of Arizona

A life-assisting system to enhance the quality of life for people with visual impairment. The system integrates state-of-the-art sensing and sensory stimulation with light detection and ranging (LiDAR), machine learning, and advanced haptic navigation to provide the...

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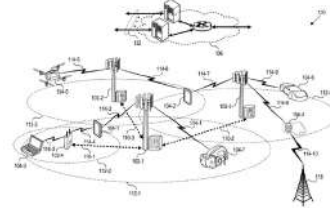
## Predicting An Attribute Of An Immature Wireless Telecommunication Network, Such As A 5G Network

Publicada en Patentscope, 22/02/2024

Solicitante: T-Mobile USA, Inc.

The disclosed system obtains KPIs and configuration parameters associated with the mature and the immature network. A physical layer of the mature wireless telecommunication network corresponds to a physical layer of the immature wireless telecommunication network. 2024-02-22

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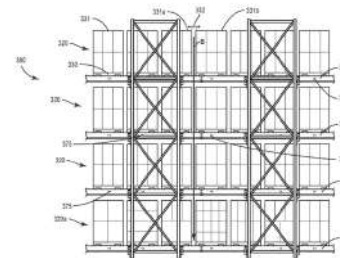
## Pallet Spacing System and Method

Publicada en Patentscope, 22/02/2024

Solicitante: FRAZIER INDUSTRIAL COMPANY

A system and method for operating robotic pallet transportation carts and providing uniform spacing between pallets of goods, to improve the vertical alignment of the gaps between the pallets of a multilevel commercial warehouse rack. Indicators are positioned along a storage 2024-02-22

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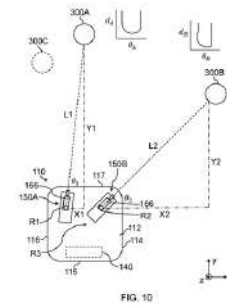
## Mobility Platform For Autonomous Navigation Of Worksites

Publicada en Patentscope, 22/02/2024

Solicitante: RUGGED ROBOTICS INC. [US]

A mobility platform is configured to execute one or more tasks in a worksite including a first passive landmark and a second passive landmark. The mobility platform may include a chassis, a drive system supporting the chassis, a first laser rangefinder...

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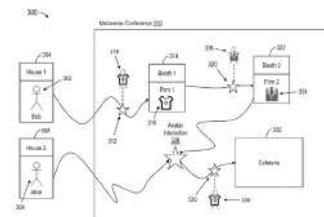
## Hyper-Personalized Feature Morphing In Metaverse

Publicada en Patentscope, 22/02/2024

Solicitante: International Business Machines Corporation

Aspects of the invention include systems and methods configured for hyper-personalized feature morphing of an avatar within a metaverse. A non-limiting example computer-implemented method includes predicting a next interaction for the avatar and comparing one or more current 2024-02-22

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# Machine Learning-Based Approaches For Synthetic Training Data Generation And Image Sharpening

Publicada en Patentscope, 22/02/2024

Solicitante: Samsung Electronics Co., Ltd.

A method includes obtaining an input image that contains blur. The method also includes providing the input image to a trained machine learning model, where the trained machine learning model includes (i) a shallow feature extractor configured to extract one or

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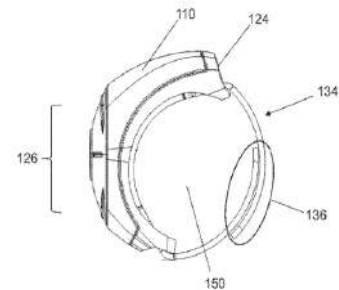
## Smart Ring

Publicada en Patentscope, 22/02/2024

Solicitante: Genki Instruments ehf.

A wearable device is described. The wearable device includes a body portion and an adjustable strap affixed to a body portion to form an opening. The opening receives a body part of a user therein. The wearable device includes a control

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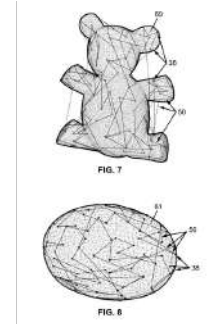
# Automated Surface Inspection Or Processing Of Targets By A Robot

Publicada en Patentscope, 22/02/2024

Solicitante: FUNDACIÓN TECNALIA RESEARCH & INNOVATION [ES]

A method for automated surface inspection or processing of a target by a robot or automatic positioning devices, inter alia comprising: converting a 3D model of a surface mesh into a polygon mesh; computing a set of bounding boxes for each polygon face in the polygon mesh; providing, for each polygon face, a first list indicative of all polygon faces that are adjacent to each respective polygon face

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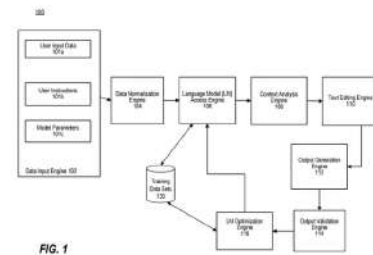
# Systems and methods for language model-based text insertion

Publicada en espacenet, 30/01/2024

Solicitante: OPENAI OPCO LLC [US]

Disclosed herein are methods, systems, and computer-readable media for automatically generating and inserting text. In an embodiment, a method may include receiving an input text prompt comprising a prefix portion and a suffix portion. The method may also include accessing a language model based on the input text prompt, and determining a set of context parameters based on the input text prompt and the language model.

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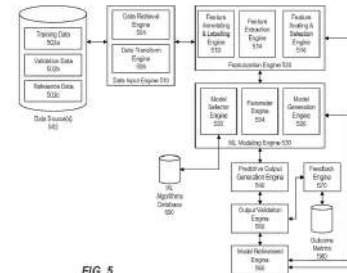
# Using machine learning to train and use a model to perform automatic interface actions based on video and input datasets

Publicada en espacenet, 30/01/2024

Solicitante: OPENAI OPCO LLC [US]

Disclosed herein are methods, systems, and computer-readable media for training a machine learning model to label unlabeled data and/or perform automated actions. In an embodiment, a method comprises receiving unlabeled digital video data, generating pseudo-labels for the unlabeled digital video data, the generating comprising receiving labeled digital video data, training an inverse dynamics model (IDM) using the labeled digital video data

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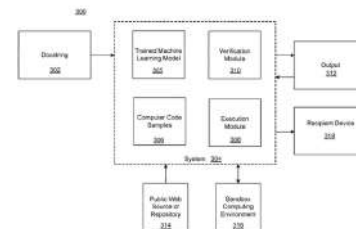
# Systems and methods for generating natural language using language models trained on computer code

Publicada en espacenet, 18/01/2024

Solicitante: OPENAI OPCO LLC [US]

Disclosed herein are methods, systems, and computer-readable media for generating natural language based on computer code input. In an embodiment, a method may comprise one or more of: accessing a docstring generation model configured to generate docstrings from computer code

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# PUBLICACIONES CIENTÍFICAS

## Coercing LLMs to do and reveal (almost) anything

Publicada en arxiv.org, 21/02/2024

It has recently been shown that adversarial attacks on large language models (LLMs) can “jailbreak” the model into making harmful statements. In this work, we argue that the spectrum of adversarial attacks on LLMs is much larger than merely jailbreaking. We provide a broad overview of possible attack surfaces and attack goals.

[Ver más..](#)



## KIER's Success in the Development of the World's Top-level Semi-transparent Perovskite Solar Cells.

Publicada en kier.re.kr, 21/02/2024

The issue of metal oxide layer degradation in semi-transparent perovskite solar cells successfully tackled and resolved, demonstrating significant progress for the first time in the world. Applied to the first domestic bifacial tandem solar cell fabrication, contributing to power output improvement.

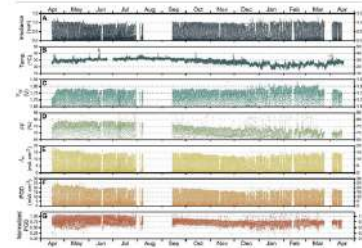
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## One-year outdoor operation of monolithic perovskite/silicon tandem solar cells

Publicada en sciencedirect.com, 15/02/2024

Perovskite/silicon tandem solar cells have gained significant attention as a viable commercial solution for ultra-high-efficiency photovoltaics. Ongoing research efforts focus on improving device performance, stability, and up-scaling. Yet, paradoxically, their outdoor behavior remains largely unexplored.

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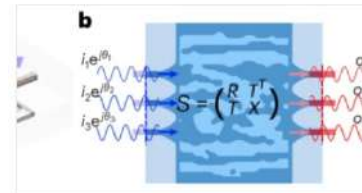


## Inverse-designed low-index-contrast structures on a silicon photonics platform for vector–matrix multiplication

Publicada en nature.com, 16/02/2024

Inverse-designed silicon photonic metastructures offer an efficient platform to perform analogue computations with electromagnetic waves. However, due to computational difficulties, scaling up these metastructures to handle a large number of data channels is not trivial. Furthermore, a typical inverse-design procedure is limited to a small computational domain and therefore tends to employ resonant features to achieve its objectives

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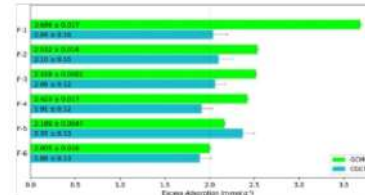


## A generative artificial intelligence framework based on a molecular diffusion model for the design of metal-organic frameworks for carbon capture

Publicada en nature.com, 14/02/2024

Metal-organic frameworks (MOFs) exhibit great promise for CO<sub>2</sub> capture. However, finding the best performing materials poses computational and experimental grand challenges in view of the vast chemical space of potential building blocks. Here, we introduce GHP-MOFassemble, a generative artificial intelligence (AI),

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## An Enhanced Analysis of Traffic Intelligence in Smart Cities Using Sustainable Deep Radial Function

Publicada en arxiv.org, 24/01/2024

Smart cities have revolutionized urban living by incorporating sophisticated technologies to optimize various aspects of urban infrastructure, such as transportation systems. Effective traffic management is a crucial component of smart cities, as it has a direct impact on the quality of life of residents and tourists. Utilizing deep radial basis function (RBF) networks, this paper describes a novel strategy for enhancing traffic intelligence in smart cities.

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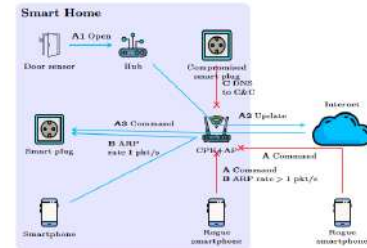
Figure 2 Model traffic in OMNET++ simulator.

# Supervising Smart Home Device Interactions: A Profile-Based Firewall Approach

Publicada en arxiv.org, 23/01/2024

Internet of Things devices can now be found everywhere, including in our households in the form of Smart Home networks. Despite their ubiquity, their security is unsatisfactory, as demonstrated by recent attacks. The IETF's MUD standard has as goal to simplify and automate the secure deployment of end devices in networks.

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# Automation of Smart Homes with Multiple Rule Sources

Publicada en arxiv.org, 3/01/2024

Using rules for home automation presents several challenges, especially when considering multiple stakeholders in addition to residents, such as homeowners, local authorities, energy suppliers, and system providers, who will wish to contribute rules to safeguard their interests. Managing rules from various sources requires a structured procedure, a relevant policy, and a designated authority to ensure authorized and correct contributions and address potential conflicts.

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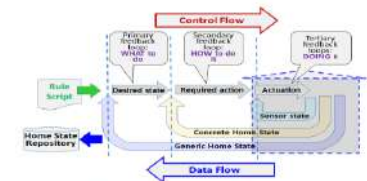
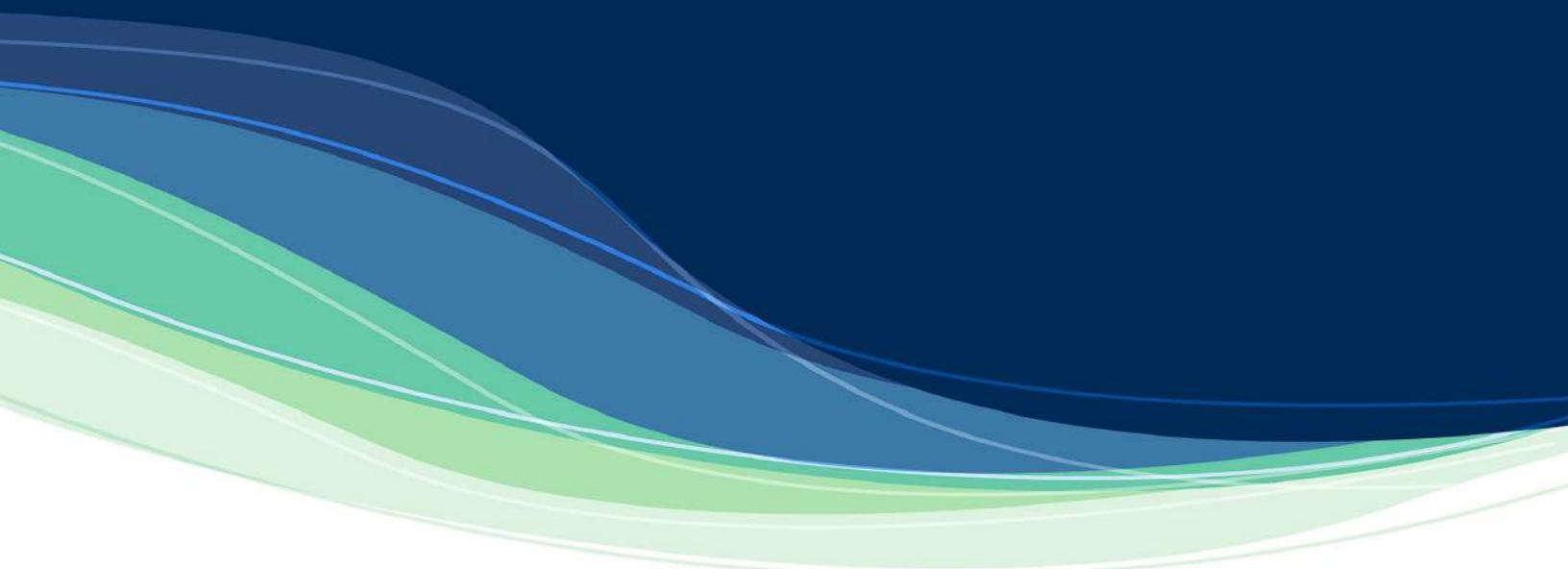


Figure 1: The layered architecture of the smart-home system with three levels of feedback loops.



**SmartLivingPlat**

Plataforma Tecnológica de la Domótica  
y las Ciudades Inteligentes