KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS), ERODE – 638107

DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY

IT Bulletin

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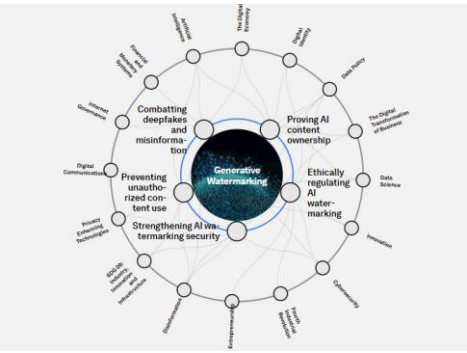
KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS), ERODE

DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY

IT BULLETIN **Date : 09.12.2024**

GENERACTIVE WATERMARKING

AI-generated content becomes more widespread, ensuring authenticity, ownership and traceability is critical for verifying authorship and protecting intellectual property. Generative watermarking embeds invisible or detectable markers directly into AI-generated text, images, audio and video, allowing content to be traced back to its source. Unlike traditional watermarking, which is added to existing content, this method integrates content protection into the generative AI model itself. Generative watermarking plays an important role in deep fake detection, digital rights management and content attribution. A major challenge is ensuring watermarks remain tamper-resistant and effective across various formats as AI technologies evolve.



The embedding or the encoding process can be achieved in various ways including adding noise patterns and modifying low-order bits.

The whole watermarking process can be implemented in three main ways:

- During the generative process itself (generative watermarking).
- By editing already generated media (edit-based watermarking).
- By altering the generative model's training data (data-driven watermarking).
- Each of these methods has its own unique strengths, and the choice of technique depends on the type of content and the use case.

Submitted by

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IT BULLETIN **Date : 11.12.2024**

BRAVIA THEATRE U

BRAVIA Theatre U is a personal speaker that immerses one in movies without disturbing others. Combine our sleek wireless neckband speaker with Dolby Atmos and a compatible BRAVIA for immersive 360 Spatial Sound, and enjoy powerful soundtracks and crystal-clear dialogue. one can even pair with another BRAVIA Theatre U to share the experience.

Every word, crystal-clear

Never again struggle to hear dialogue. The X-Balanced Speaker Unit enhances movies and dramas with cinema-quality audio so every word spoken by the actors is clear and precise.

X-Balanced Speaker Unit

Optimum speaker size in a compact body. Increases sound pressure and reduces distortion for clear dialogue.

Listen together Simultaneous playback

The TV and BRAVIA Theatre U can play sound simultaneously. So while one`s partner is watching TV, another person can listen in the same high quality through her/his personal neckband speaker as she/he cooks, tidy up or moves around the room.

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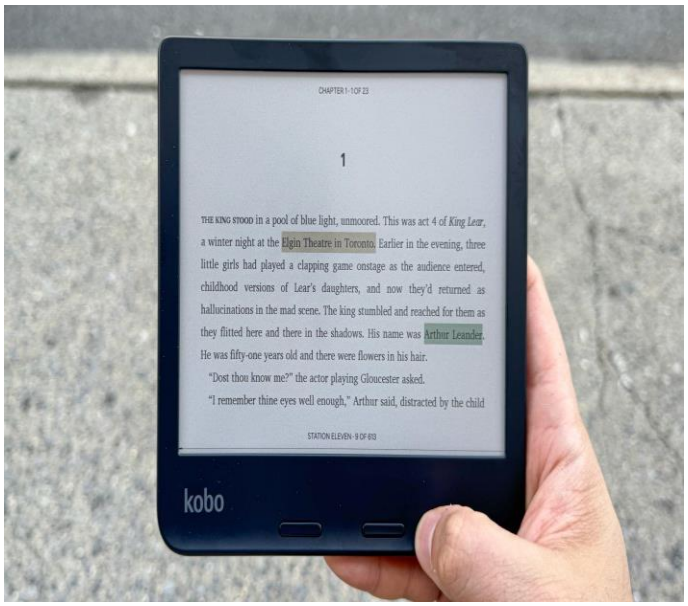
IT BULLETIN **Date : 12.12.2024**

AN ARTISTIC E-READER

RAKUTEN KOBO LIBRA COLOUR

An e-reader with a color display

In testing, it is found that the Libra Colour's 7-inch E Ink Kaleido 3 screen is a delightful treat. Not only does this panel offer even lighting so each page is well-lit but its color output makes e-books feel less like mere facsimiles. The cover of Emily St. John Mandel's "Station Eleven" looks more real when can see green grass alongside amber tents under the night's sky, and the waves on the cover of Gabrille Zevin's "Tomorrow, and Tomorrow, and Tomorrow" look more alive than before.



The 7-inch device's vivid colors most noticeably benefit comics and graphic novels, making them feel true to their print versions. The notetaking experience is also greatly improved; using a stylus (sold separately), one can highlight text in color instead of boring gray.

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IT BULLETIN **Date : 13.12.2024**

SEGWAY NINEBOT GOKART PRO

The Segway GoKart Pro 2 is a 3-in-1 device that can be used as a go-kart outdoors, a gaming simulator indoors, and a self-balancing scooter. It boasts a top speed of 26.7 mph, a range of up to 15.5 miles, and can be converted to a game simulator with haptic feedback and adjustable steering.

Go-Kart Mode:

High-Speed Racing: The GoKart Pro 2 can reach speeds of up to 26.7 mph.

Versatile Riding Modes: It offers different riding modes like Eco, Sport, Race, and Manual, allowing users to adjust their experience.

Adjustable Steering and Chassis: The steering wheel and chassis can be adjusted to accommodate riders of different heights, from 51.2 to 74.8 inches.

Gaming Mode:

Immersive Racing Experience:

By connecting to a computer, the GoKart Pro 2 transforms into a racing game simulator.

Haptic Feedback:

Users can feel every twist, turn, and collision through 360-degree haptic feedback.

Adjustable Steering and Paddles:

The steering wheel is auto-centering, and gear shift paddles are included.

Realistic Sounds:

An attachable Gen 2 engine speaker provides four different auditory experiences, simulating the roar of an engine.

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IT BULLETIN **Date : 16.12.2024**

AGENTIC AI

Agentic AI is a type of artificial intelligence that focuses on autonomous systems capable of making decisions, taking actions, and learning on their own, without constant human intervention. These systems operate in four key stages: perception, reasoning, action, and learning, enabling them to adapt and improve over time. Agentic AI is distinct from traditional AI in its ability to autonomously handle tasks and complex workflows, increasing efficiency and enabling broader automation.

Agentic AI is the technology that powers AI agents so they can act autonomously without human oversight. By serving as a comprehensive platform, agentic AI facilitates seamless interaction between AI agents and humans, fostering a collaborative environment where both can work together. This platform has a suite of tools and services to help AI agents learn, adapt, and collaborate so they can quickly handle complex and dynamic tasks. It’s the next frontier of AI known for its ability to operate independently by making decisions, adapting to dynamic situations, setting goals, and reasoning.

There are three main features that contribute to agentic AI:

1. **Autonomy:** Agents can perform tasks on their own, without human oversight or direction.
2. **Adaptability:** They can learn from their interactions, receive feedback, and change their decisions based on what they've learned.
3. **Goal orientation:** They can take specific tasks and reason about how to achieve them.

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IT BULLETIN **Date : 17.12.2024**

SYNTHETIC MEDIA

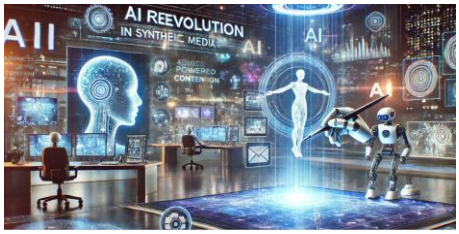
Types of Synthetic Media

AI-Generated Text

AI-driven natural language processing (NLP) models, such as OpenAI's GPT-4, are capable of generating human-like text for various purposes. These models power applications including chatbots, automated content creation, and virtual assistants. AI-generated text is widely used for writing articles, summarizing documents, and even creating fiction and poetry.

Synthetic Images and Videos

AI-powered tools like Generative Adversarial Networks (GANs) enable the creation of highly realistic synthetic images and videos. These tools can generate deepfake videos, AI-created portraits, and virtual influencers. Popular applications include face-swapping technology in filmmaking, AI-driven advertising, and the enhancement of video effects in digital media production.



AI-Generated Audio and Speech Synthesis

Synthetic Media also extends to AI-generated audio, including speech synthesis and voice cloning. Deep learning models can replicate human voices with astonishing accuracy, allowing for text-to-speech applications, audiobook narration, and voice assistance. Companies like Google, Amazon, and Microsoft are at the forefront of developing realistic AI-generated voices for customer interactions and accessibility tools.

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IT BULLETIN **Date: 23.12.2024**

H2 CLIPPER

By replacing traditional assembly lines with robotic swarms, this breakthrough enables aircraft and large aerospace assets to be built faster, at a significantly lower cost, and with far greater precision. H2 Clipper has developed high-speed, **Pipeline-in-the-Sky** hydrogen-powered airships for long-distance global transport. Its airships use no fossil fuels and offer a range commercial and humanitarian applications.

Automated manufacturing: Robots work in a coordinated "**swarm**" to assemble airframes, attach the exterior skin, and install structural and internal components. H2C said they also perform bonding and fastening operations, conduct in-process quality inspections, and carry out other complex, high-precision tasks.

- **Artificial intelligence-driven optimization:** Machine learning and generative AI guide the robotic swarm to self-correct, improve manufacturing precision, reduce errors, and optimize construction timelines, asserted the company.
- **Scalability and safety:** The system uses built-in sensors and AI-driven oversight to safely manage all operations. This assures collision-free operation and eliminates the need for workers to operate at dangerous heights, H2C claimed. With no fixed assembly line or gantries required, operators can remotely supervise manufacturing and scale across multiple locations.
- Heavy-lift robotics integration: H2C said its technology enables the construction of large-scale structures entirely in place horizontally or vertically using autonomous robots capable of repositioning and aligning major components.

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IT BULLETIN **Date : 24.12.2024**

AI CRAFTED EXPERIENCES IN EXTENDED REALITY

AI and XR are reshaping how we engage with digital content and interact with one`s surroundings, creating new possibilities across many industries. Together, anybody is making experiences more immersive, personalized, and interactive. Whether it's improving how one`s shop, learn, play, or work, AI and XR are driving a shift in how one`s interact with technology.

Enhanced Immersion

AI deepens the immersive feel of XR by making virtual environments more responsive. Whether it's a game that changes based on player actions or virtual shopping that lets customers try products, AI boosts the realism and connection to the experience.

Personalization

AI allows XR to deliver highly personalized experiences. It adapts content based on user preferences or behavior, whether recommending products or adjusting learning environments, making every experience feel tailored to the individual.

Interactivity

AI increases the interactivity of XR by allowing users to interact naturally through gestures, voice commands, and more. It can drive virtual assistants or intelligent characters that respond in real time, creating more engaging experiences.

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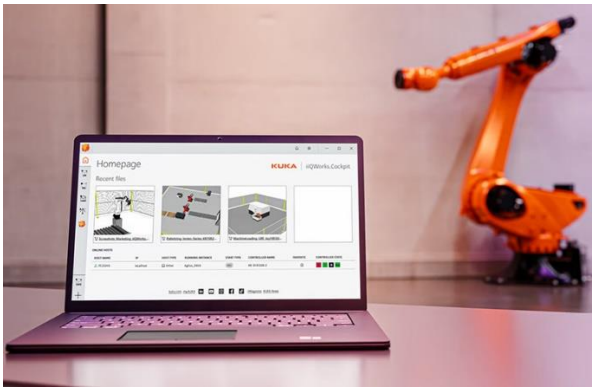
IT BULLETIN **Date : 26.12.2024**

IIQKA OS2

KUKA last week unveiled the iiQKA.OS2 operating system which it said is scalable, customizable, and includes a complete virtual robot controller. The company claimed that its system is ready for artificial intelligence and the new ISO 10218:2025 industrial robot safety standard.

It also said iiQKA.OS2 is “cyber-resilient,” making digital manufacturing future-proof. KUKA added that a robot controller with the operating system is easier to use and more accessible. This is thanks to combination of a web-based user interface and the ability to use one’s own teach pendants or the KUKA smartPAD.



KUKA said iiQKA.OS2 combines the proven core of its KUKA.SystemSoftware (KSS) and a modern user interface with modular safety to meet automation requirements. The company asserted that its decades of development experience, a modern tech stack, and the latest web technologies offer new possibilities in terms of functionality, user experience, and workflows.

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IT BULLETIN **Date : 27.12.2024**

ARTIFICIAL INTELLIGENCE ROBOTICS

THE ULTIMATE AiR KITCHEN

Beyond its remarkable dexterity, the A-AiR kitchen takes control to the next level. It can seamlessly manage a variety of kitchen equipment, including faucets, ovens, blenders, whisk or any other kitchen equipment of different type. The impressive 43 inch 4k screen serves as the command center, allowing users to control the kitchen, choose the recipes, generate automatic shopping lists, and integrate with scales for precise measurements.

Introduced at GITEX 2020, the A-AiR kitchen gained notable acclaim, and was the sole live exhibition at GITEX amid the COVID pandemic.

Having successfully completed the testing phase, final design approvals, and currently undergoing the beta testing, the A-AiR Robotic Kitchen is poised to elevate your culinary experience to unprecedented heights. Welcome to the future of cooking, where innovation meets efficiency in every aspect of meal preparation.

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IT BULLETIN **Date : 30.12.2024**

POST-QUANTUM CRYPTOGRAPHY (PQC)

Post-Quantum Cryptography (PQC) is the development of cryptographic algorithms that are secure against attacks by quantum computers. It aims to ensure that encrypted data remains secure even with the advancement of quantum computing technology. PQC algorithms rely on different mathematical problems than those currently used, making them resistant to quantum attacks.

Quantum Computers and Cryptography:

Quantum computers have the potential to break many of the public-key encryption algorithms currently in use, like RSA and ECC. This is because quantum computers can solve certain mathematical problems much faster than classical computers, such as factoring large numbers (which is the basis of RSA) or solving the discrete logarithm problem (which is the basis of ECC).

Lattice-Based Cryptography:

This approach relies on the difficulty of solving problems involving lattices, which are regular structures formed by points in a multi-dimensional space.

Hash-Based Cryptography:

This method utilizes cryptographic hash functions, which produce a fixed-size output (a "hash") from any input data.

Code-Based Cryptography:

This approach uses error-correcting codes, which are mathematical systems for detecting and correcting errors in data transmission.

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IT BULLETIN **Date : 31.12.2024**

POLYFUNCTIONAL ROBOTS

Polyfunctional robots are versatile machines capable of performing multiple tasks by adapting their hardware or software configurations, rather than being limited to a single purpose. Anybody leverage modular components, AI, and machine learning to seamlessly switch between different functions, maximizing efficiency and resource utilization. These robots are finding applications in various industries like manufacturing, healthcare, and logistics, offering adaptability and flexibility.

Key Characteristics:

Adaptability:

Polyfunctional robots can adapt their hardware or software to suit different tasks, making them versatile.

Modular Components:

Many polyfunctional robots utilize modular components that can be swapped or reconfigured to perform different functions.

AI and Machine Learning:

These robots often incorporate AI and machine learning capabilities to learn, adapt, and make decisions in real-time, as detailed by LinkedIn and StatusNeo.

Versatility:

Polyfunctional robots can be deployed in various environments and industries, performing diverse tasks like manufacturing, logistics, healthcare, and domestic assistance.

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IT BULLETIN **Date : 02.01.2025**

DISINFORMATION SECURITY

Types of disinformation

The table below outlines several types of disinformation. Each type hurts people and organizations in different ways spreading false stories, ruining reputations, enabling criminal activity, prompting cyberattacks, stealing money, impersonating trusted entities, and more.

Disinformation Type	How It Works
Cheapfakes	Authentic (real) video and audio clips are slowed down, sped up, or shown out of context.
Deepfakes	Inauthentic (false) video and audio clips are generated to deceive. • Audio deepfakes simulate other people's voices. • Video deepfakes feature recognizable faces and full-body video of people, places, and things.
Forgeries	Forged artifacts use faked certificates, logos, social media posts, and other material for malicious purposes. Frequently posted alongside authentic content, forgeries may be promoted as "leaked" material to appear more credible.
Phishing, Vishing, and Smishing	Techniques to trick or lure users into disclosing sensitive, confidential, or personal information. • Phishing uses proxy (fake) websites and deceptive email to get users to disclose information. • Vishing uses voicemails or phone calls to trick users into information disclosure.
Proxy websites	Fronts for malicious actors, proxy websites launder disinformation about high visibility events and inauthentic content, to deceive or take advantage of unsuspecting visitors.

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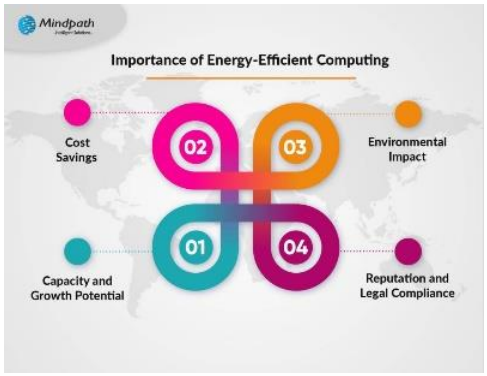
IT BULLETIN **Date : 03.01.2025**

ENERGY-EFFICIENT COMPUTING

Energy-Efficient Computing is a method of employing technology to execute activities with as little energy as feasible while maintaining performance and functionality. It entails optimizing both hardware (processors and servers) and software (programs and algorithms) in order to minimize energy consumption while retaining efficiency.

Importance of Energy-Efficient Computing



1. Capacity and Growth Potential

Energy-efficient computing enables data centres to handle larger workloads and more users while consuming less energy. Data centres can enhance performance and output while remaining within their power constraints by optimizing energy use.

2. Cost Savings

Data centres require vast quantities of energy to run and cool their equipment, which can significantly raise operating expenses.

3. Environmental Impact

Energy production, notably the use of fossil fuels to create electricity, accounts for a large amount of worldwide CO2 emissions.

4. Reputation and Legal Compliance

With increased knowledge of environmental challenges, customers and stakeholders prefer companies that demonstrate a commitment to sustainability.

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IT BULLETIN **Date : 04.01.2025**

NEUROLOGICAL ENHANCEMENT

The more altruistic benefits of brain augmentation for medical care are also immense, with use cases ranging from cognitive illness prevention to restoring vision and hearing.

Neurotechnologies will read and write to the brain

BBMIs are at the heart of neurological enhancement technologies. These brain-altering neural interfaces enable two-way communication between a human brain and a computer or machine through electrostimulation.

BBMIs measure electrical brain activity and monitor the user's mental state through a head-mounted wearable or an invasive implant. By capturing inputs and delivering outputs, brain augmentation will enable organizations to monetize:

- Adding capabilities (information processing, memory, learning and gaming)
- Extracting information (thoughts and emotions)

Businesses will see value in the form of improved employee performance and customer engagement. For example, through:

- **Human upskilling:** Neurotechnologies will enhance cognitive abilities such as memory, attention, learning and problem solving. Being an "enhanced" human may become a future condition of employment.
- **Next-generation marketing:** Brands can know consumers' desires in real time.
- **Performance:** Neurological enhancement helps drivers stay alert and could soon provide personalized education and enable an aging population to work longer.

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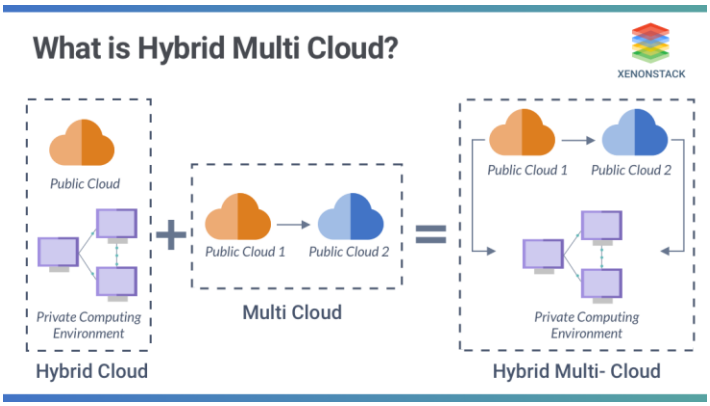
IT BULLETIN **Date : 06.01.2025**

HYBRID COMPUTING

Hybrid Cloud: Combines on-premises infrastructure with public and private cloud services, allowing data and applications to move seamlessly between environments.

Multi-Cloud: Involves using services from multiple cloud providers to avoid dependency on a single vendor and to capitalize on the unique offerings of each.

According to recent industry reports, a significant percentage of enterprises are accelerating their adoption of hybrid and multi-cloud strategies to enhance flexibility and resilience.



Key Drivers of Adoption

1. **Avoiding Vendor Lock-In**: By distributing workloads across multiple providers, businesses can prevent over-reliance on a single vendor.
2. **Optimizing Performance**: Different cloud providers offer varying strengths; leveraging multiple clouds allows businesses to optimize for performance and cost.
3. **Enhancing Resilience**: Multi-cloud strategies provide redundancy, reducing the risk of downtime and data loss.
4. **Meeting Compliance Requirements:** Hybrid models enable sensitive data to remain on-premises while still benefiting from cloud scalability.

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IT BULLETIN **Date : 07.01.2025**

SUSTAINABLE TECHNOLOGY FOR MOBILE APPS

Sustainable technology for mobile apps will focus on eco-friendly app development practices, including energy-efficient coding, sustainable cloud solutions, and green UI/UX design. This will also involve developing apps that promote environmental awareness and encourage sustainable behaviors through features like carbon footprint tracking, eco-friendly shopping, and energy management.

Key aspects of sustainable technology for mobile apps in 2025:

Efficient Coding: Streamlining code and reducing bloat to minimize processing power and energy consumption on devices.

Sustainable Cloud Computing: Leveraging energy-efficient cloud services to power mobile apps.

Eco-Friendly UI/UX: Designing user interfaces with dark mode, battery-efficient visuals, and minimal data consumption to reduce resource usage.

Green Apps: Developing apps that promote environmental sustainability, such as those related to renewable energy, waste reduction, and eco-travel.

Carbon Footprint Trackers: Apps that monitor and help users reduce their environmental impact through their daily activities.

Sustainable Shopping Apps: Platforms that connect users to eco-friendly products and brands.

Eco-Travel Apps: Apps that promote green travel options, such as public transportation and eco-friendly hotels.

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IT BULLETIN **Date: 08.01.2025**

TOP SEVEN PEDICTIVE ANALYTICS TOOLS

Alteryx AI Platform:

Alteryx offers a visual IDE for creating data pipelines and automates rote tasks through RPA.

Dataiku:

Dataiku provides a full data curation stack with a dedicated predictive module.

H2O.ai:

H2O.ai is known for its automated AI pipelines, with their Driverless AI adapting to incoming data.

IBM Watson Studio:

IBM Watson Studio offers a cloud-based platform for data scientists to collaborate and build AI models.

Microsoft Azure Machine Learning:

Microsoft Azure Machine Learning provides a comprehensive suite of tools for machine learning tasks, including model building, deployment, and management.

SAP Analytics Cloud:

SAP Analytics Cloud is a robust BI platform that integrates well with SAP ecosystems, offering predictive analytics and AI capabilities.

SAS:

SAS is a leading analytics provider with industry-specific solutions and a focus on advanced analytics and statistical modeling.

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IT BULLETIN **Date : 09.01.2025**

CONTINUOUS THREAT EXPOSURE MANAGEMENT (CTEM)

Continuous Threat Exposure Management (CTEM) is a framework for proactively managing and mitigating threat exposure through an iterative approach that emphasizes building structured organizational processes in addition to leveraging security tools.

Benefits of implementing CTEM

- **Reduced risk exposure**: Using continuous monitoring to identify threats before they can impact business operations helps reduce risk exposure.
- **Improved prioritization**: CTEM helps organizations understand the severity of each threat so they can determine which ones require urgent attention and resources.
- **Proactive security posture**: The proactive approach of CTEM is seen particularly in the scoping and discovery steps, which work continuously to address emerging threats.
- **Stronger incident response**: The simulated attacks and automated remediation steps defined during the validation phase verify the effectiveness of response plans and their triggers, empowering teams to respond faster to incidents.

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IT BULLETIN **Date : 10.01.2025**

NOKIA INFINITY PRO

The “candy bar” form factor has emerged as the one true smartphone shape because of its handy and compact design. That doesn’t mean it isn’t the only possible form, though, especially when consider that the top and bottom of these devices don’t need to be perfectly flat. It’s not like be standing it up or squeezing it alongside other flat and rectangular objects. This “Nokia Infinity Pro” concept challenges that status quo with a thin pill-shaped design that seems like a cross between a foldable clamshell and a smartwatch all rolled into one.

The more curvaceous shape of this concept phone supposedly rests more comfortably in one’s hand with no corners to cut into one`s skin. There might be some doubts about whether that would also make it too slippery to hold, but that’s not always a uniform experience. This Nokia Infinity Pro wouldn’t be the first to try out this design either, as the likes of the short-lived “open source” phones like the OpenMoko and Neo Freerunner sported similar shapes.

As interesting as it might look, however, there are some practical issues with such a design. For one, putting the phone face down always risks scratching the screen. And then there’s the matter of what UI elements can be used at the top and bottom of the display since most platforms and content are created for rectangular screens. Maybe someday, have more adaptable software, and that will be the time for the Nokia Infinity Pro to truly shine.

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IT BULLETIN **Date: 20.01.2025**

JOYSTICK PRO MAX

The conceptual Apple Vision Joystick Pro Max has been designed by Alex Casabò as a companion product for use with the Apple Vision Pro spatial computing headset to elevate gaming experiences. The controllers are characterized by their sleek construction that follows on the same design language as the aforementioned Virtual Reality (VR) and Augmented Reality (AR) headset. The controllers would work in multiples with one in each hand and feature touchscreen panels on the top portion that would offer control over a wide variety of in-game accoutrements like weaponry.

The conceptual Apple Vision Joystick Pro Max builds on the excitement surrounding the upcoming spatial computing headset from Apple and identifies how it could be elevated with aftermarket accessories.

Trend Themes

1. Spatial Computing Gaming - The trend of spatial computing gaming is on the rise, creating opportunities for innovative gaming accessories like the Apple Vision Joystick Pro Max.

2. Aftermarket Controller Accessories - The demand for aftermarket accessories for spatial computing controllers presents an opportunity for designers and manufacturers to create innovative products like the Apple Vision Joystick Pro Max.

3. Sleek Controller Design - The trend towards sleek and stylish controller designs, like the Apple Vision Joystick Pro Max, enhances the overall gaming experience for spatial computing users.

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IT BULLETIN **Date: 21.01.2025**

HUAWEI WATCH BUDS

The pop-up cover opens with a gentle nudge, made possible by the precise rotating shaft design, and a first-ever attachable magnetic design fuses earbuds and watch, to double the fun and convenience. When using the device, make sure that the earbud compartments do not get wet. When washing one`s hands, prevent water from touching the watch and earbuds. Do not use them when participating in activities involving water, such as swimming, diving, taking a shower, or washing a car.

Effortless Magnetic Attachment

A cutting-edge magnetic array allows one to attach and remove the earbuds from the watch cover, from any angle, without having to exert any force.

The 3D curved glass exterior is seamlessly imbedded into the 1300°C refined steel body, with 710 Clous de Paris ornaments on the button and watch crown, to create a sophisticated look and feel.

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IT BULLETIN **Date: 22.01.2025**

POLYFUNCTIONAL ROBOTS

Polyfunctional robots are designed to perform a wide range of tasks, often in diverse environments, making them versatile tools for various applications. Examples include robots used in defense for surveillance and bomb disposal, robots like Baxter in manufacturing for assembly line tasks, and robots used in hospitals for logistics, medication delivery, and patient monitoring.

Examples:

1. **Defense and Security:**

PackBot (iRobot):

Equipped with modular payloads like cameras and grippers for bomb disposal and reconnaissance.

SWORDS robot:

Used for urban warfare tasks like patrolling streets and securing checkpoints.

Boston Dynamics' Spot:
Used for remote inspection and tactical operations by military and law enforcement.

2. Manufacturing and Automation:

Baxter (Rethink Robotics): Designed for manufacturing, capable of packing, sorting, and machine tending.

FANUC robots: Adapt seamlessly between assembly and quality checks.

ABB Robotics' YuMi: Works on assembly lines, supporting human-robot collaboration.

3. Healthcare:

Intuitive Surgical robots: Assist in minimally invasive surgeries and diagnostics.

TUG autonomous mobile robots: Transport medications and supplies within hospitals.

Moxi: An AI-powered hospital robot assists nurses with logistics, medication delivery, and patient monitoring.

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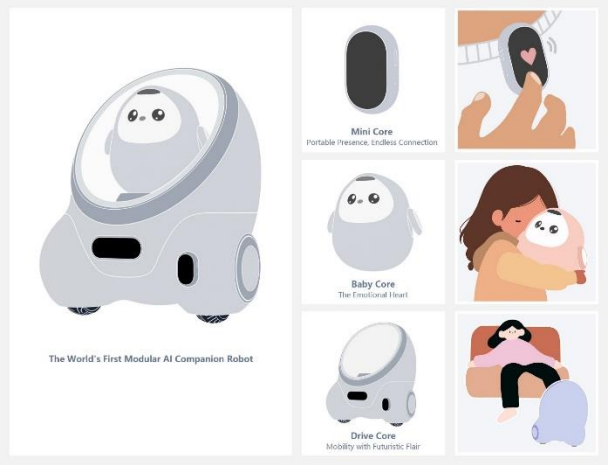
IT BULLETIN **Date: 23.01.2025**

TCL AI ME ROBOT

TCL AI Me, pronounced ‘Amy,’ is a concept for a robot companion, a friendly presence rather than a lumbering humanoid. The wheeled droid is a sort of webcam on wheels, trundling around the house to ‘preserve meaningful moments with your family,’ as well as undertaking security duties. Styled like a tiny creature sitting atop a futuristic mobility pod, AI Me is an indication of the diverse future of robotic pets.



TCL Ai Me fits naturally into one`s daily routine, almost like a cherished family member. It lights up the simplest experiences—whether by engaging in lively chats, playing games, telling stories at bedtime, or offering a comforting conversation after a long day. Over time, TCL Ai Me witnesses and records one`s family’s growth, celebrating each joyful moment and every milestone in a child’s journey. These fleeting instances become treasured memories, woven into one`s life together.

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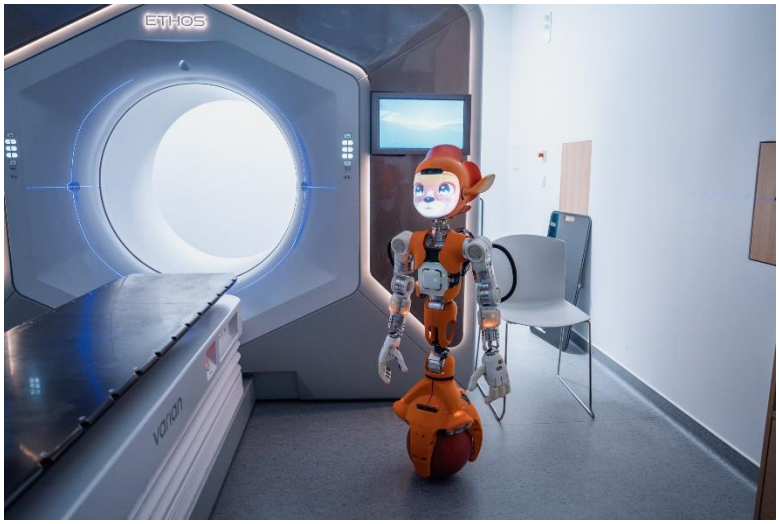
IT BULLETIN **Date: 24.01.2025**

MIROKAI ROBOT

Parisian-based startup Enhanced Tools debuted an upgraded version of its anime-style quasi humanoid robot, Mirokaï. First introduced in 2022, Mirokaï is inspired by cartoon design and has a screen-based ‘face’ that allows for limitless expressions and characters.



The company has now integrated an LLM for better AI performance and already has a practical application for the machine; ‘offering emotional support and company to children in the Montpellier Cancer Institute’s paediatric radiotherapy department when healthcare professionals or their families cannot join them during treatments.’

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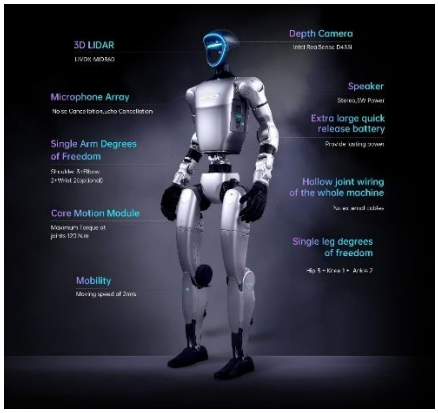
IT BULLETIN **Date: 27.01.2025**

UNITREE G1 AND G2 ROBOTS

The contents of Unitree's robotic stable conforms to the general perception of how the next generation of android will appear. In addition to its Go2 Canine robot (also available as the Go2-W wheeled version), the G1 is the company's second humanoid robot.



Model : G1

Height, Width and Thickness（Stand）： 1320x450x200mm
1320x450x200mm

Height, Width and Thickness（Fold）： 690x450x300mm
690x450x300mm

Weight (With Battery) : About 35kg
About 35kg+

Total Degrees of Freedom : 23
23 - 43

An evolution of the H1 model, the G1 is described as a 'humanoid agent AI avatar,' with hyper-flexible jointed arms and legs, 3D lidar based vision system and two hours of battery life. Standing 130cm high.

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IT BULLETIN **Date: 28.01.2025**

DWARFLAB DWARF3 SMART TELESCOPE

Practically pocketable, Dwarflab claim their new gadget is the world's lightest smart telescope. In practical terms, this means a tiny device that'll introduce one to the world of astrophotography, with a host of automated systems to create stunning imagery of the night sky.

Introducing DWARF 3, the world's most portable and all-round smart telescope with its compact size, automatic setup, and shooting capabilities, the DWARF 3 smart telescope makes astrophotography accessible to anyone, anywhere. Capture the Moon, Sun, Milky Way, Galaxy, and Nebula in just minutes. One can also use the DWARF 3 for bird watching and shooting 1 billion pixel panorama photos.

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IT BULLETIN **Date: 29.01.2025**

ULTRAHUMAN RARE

While the Omnia scales up our obsession with body metrics, Ultrahuman's new Rare smart ring takes the opposite approach. Billed as the world's first 'luxury smart ring,' Rare is available in 18K gold or platinum, and will be retailed through Printemps, Paris and Selfridges in London.

All three Rare rings, Desert Rose (rose gold), Dune (gold) and Desert Snow (platinum) incorporate Ultrahuman's tiny sensors with are capable of tracking sleep, movement, Heart Rate (HR), Heart Rate Variability (HRV), stress and skin temperature.

STRESS RHYTHM SCORE

A novel capability that helps one decode stress, this score considers the variations in one`s Heart Rate (HR), Heart Rate Variability (HRV), and Resting Heart Rate (RHR) against the backdrop of one`s circadian rhythm. It tells one if one is 'stimulated', 'relaxed', or 'stressed'.

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IT BULLETIN **Date: 30.01.2025**

ROKID AR SPATIAL

A competitor for the Apple Vision Pro, Rokid's AR Spatial are augmented reality glasses that conjure up a 300" virtual screen in the space in front of one. Also onboard is a 12MP smart camera, and a smart assistant to help with things like real-time translation. While the AR Spatial glasses are less hefty than the Vision Pro, the key component is the software experience, the area Apple has the most expertise.

The Rokid AR Spatial working model involves a combination of the Rokid Max 2 glasses, the Rokid Station 2, and a compatible device (like a tablet, phone, or console). The Rokid Max 2 acts as an external display, while the Rokid Station 2 provides computing power, operating system, and controls. This allows users to stream content, play games, or use productivity apps on a large, virtual display that appears in their field of vision.

Example Applications:

- **Gaming:** Play games on a large, immersive screen directly in front of one.
- **Media Consumption:** Watch movies, TV shows, or videos on a virtual screen.
- **Productivity:** Use productivity apps like note-taking, spreadsheets, or web browsing.
- **Workspaces:** Create a virtual second screen for work or entertainment.

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IT BULLETIN **Date: 31.01.2025**

MACRO LLM

Applications of Macro LLMs in Software Development

Macro LLMs dominate when it comes to large-scale, multifaceted, and general-purpose applications. Their expansive datasets and higher processing power make them exceptionally versatile.

1. Full-Stack Development

Macro LLMs can assist with creating entire applications from backend APIs to frontend interfaces. They're particularly valuable when multiple programming languages or frameworks are involved.

Example: Developers using macro LLMs like GPT-4o can rapidly prototype entire applications by generating boilerplate code, UI components, and database queries—all in one go.

2. Documentation and Knowledge Base Generation

One of the practical benefits of macro LLMs lies in their ability to assist with documentation generation. Whether it's technical documents for APIs or user manuals, macro LLMs simplify these labor-intensive tasks.

Example: Imagine feeding your codebase into a macro LLM and receiving detailed function-level documentation, complete with examples and parameter explanations.

3. Debugging and Troubleshooting

Macro LLMs can analyze larger chunks of code and even entire projects to identify issues, suggest fixes, and predict potential vulnerabilities by referencing their extensive training data.

Example: Tools like GitHub Copilot (powered by GPT models) can flag potential bugs or offer recommendations for improving code efficiency.

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IT BULLETIN **Date: 03.02.2025**

NEUROMORPHIC COMPUTING

Neuromorphic computing is inspired by the way the human brain processes information. Instead of following conventional computational patterns, it uses custom chip designs to mimic neurons and synapses. This opens the door to parallel data handling that can be more energy-efficient.

Here are a few possible uses for Neuromorphic Computing:

- **Robotics**: One implements chips that let machines sense and respond instantly, even in unpredictable settings.
- **Medical Devices**: One gets faster analysis of signals from wearables or imaging equipment.
- **Autonomous Vehicles**: One relies on hardware that processes sensor data with less power, which helps one`s battery last.
- **Energy Management**: One run real-time grid monitoring or resource allocation that uses minimal electricity.

Top Industries Impacted

Industry	How Neuromorphic Computing Helps?
Automotive	In-car systems that can process sensor data almost instantly.
Healthcare	Rapid detection in imaging or wearable analysis with lower power drain.
Aerospace & Defense	Ultra-responsive analytics in drones or advanced navigation tools.
Industrial Automation	Real-time quality checks and adaptive robotics on factory floors.

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IT BULLETIN **Date: 04.02.2025**

REACTIVE MACHINE AI

Reactive Machine AI refers to AI systems that can only respond to current inputs. These machines **do not have memory**, **do not learn from experience**, and **do not form inferences**. They are purely reactive analysing present data to make real-time decisions.

Think of them as AI systems that operate "in the moment," with **no ability to recall the past** or plan for the future. Their strength lies in **speed, efficiency, and simplicity**.

Key Characteristics of Reactive Machine AI

1. **No Memory or Past Experience**
2. **Highly Specialized**
3. **Real-Time Decision Making**
4. **No Self-Improvement**

Reactive Machine AI Shines in 2025

1. Industrial Automation

Reactive AI powers robotic arms that perform repetitive tasks like sorting, assembling, or welding.

2. Smart Appliances

Devices like automatic vacuum cleaners and thermostats rely on reactive programming to function efficiently.

3. Gaming

Many non-player characters (NPCs) in video games use reactive AI to respond to user actions without storing player history.

4. Medical Devices

Heart rate monitors or insulin pumps often work on reactive principles, instantly responding to changes in patient vitals.

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IT BULLETIN **Date: 05.02.2025**

PREDICTIVE AI ANALYTICS

Predictive AI analytics combines all the advances in data science, machine learning and statistical modeling. Predictive AI analytics has improved industrial operations, particularly in predictive maintenance. It helps businesses forecast equipment failures and optimize maintenance schedules, reducing downtime and maintenance costs. These new technologies in AI play a crucial role in marketing personalization by enabling businesses to analyze customer behavior and preferences and deliver tailored content and recommendations. This results in higher conversion rates and customer satisfaction.

In the financial sector, predictive AI analytics are employed for risk assessment, fraud detection and investment portfolio optimization. It enables more informed and timely decision-making, reducing financial risks.

How predictive AI works

The accuracy and performance of predictive AI models largely depend on the quality and quantity of the training data. Rigorous data governance practices, data cleaning, validation and consistent updates to the data sets, guarantee that the data used is reliable, which in turn enhances the accuracy of the predictive models.

Building a predictive AI application requires a business to gather relevant data from various sources and clean it by defining missing values, outliers or irrelevant variables. The data is then split into training and testing sets, with the training set used to train the model and the testing set used to evaluate its performance. Predictive AI uses big data analytics and deep learning to examine historical data, patterns and trends; the more data provided to the machine learning algorithms, the better the predictions are.

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IT BULLETIN **Date: 06.02.2025**

AI CO-PILOTS

How Does AI Copilot Work?

Artificial intelligence (AI) technologies used in machine learning, context awareness, and natural language processing allow copilots to know what a user wants and make well-informed recommendations. AI copilots may interface with a wide variety of devices through integrations, resulting in a single, networked platform for smooth job management and communication.

The four-tiered AI copilot strategy framework should be noted to comprehend the advantages and disadvantages of this approach to learning about AI copilots.

- **Tier-one:** Basic API calls to LLMs are the cornerstone of Tier-one AI copilots' AI architecture. Low entrance barriers and a simple lift are made possible by this. These copilots provide a wealth of broad information, but their lack of domain-specific expertise may cause hallucinations.
- **Tier-two:** A tailored implementation of an optimized LLM based on an organization's data is what Tier-two AI copilots entail. Although this is a little more expensive, the results are better for security and privacy and are more tailored to the company. Because they rely on the outputs of a single LLM, they can only achieve limited performance and are restricted to one-step use cases.
- **Tier-three:** To create complicated pipelines tailored for multi-step use cases, Tier-three AI copilots connect many LLMs, utilizing each LLM's unique strengths and capabilities. Tier-three AI copilots are thus better equipped to handle problems in more complex domains, solve a wider range of use cases, and increase productivity and efficiency.
- **Tier-four:** The issues of enabling autonomous decision-making and extending staff support are tackled by tier-four AI copilots. These tier-four copilots have advanced **LLM development** systems that are particularly made for enterprise-wide deployment.

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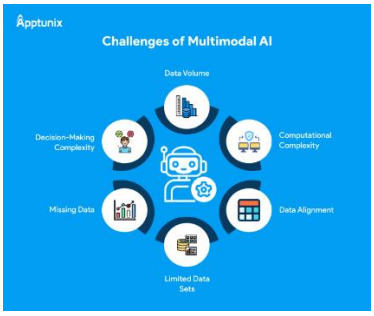
IT BULLETIN **Date: 07.02.2025**

MULTIMODAL AI

Multimodal AI is a system that integrates and processes multiple data types also known as modalities to generate results. Unlike traditional AI models that can handle only a single type of data, multimodal AI models can take in different types of data such as text, image, audio, video to output more human-like accurate results that are also contextually aware.

Google defines multimodal AI as models that process and integrate multiple data types, such as text, images, audio, and video. Their Gemini models, like Gemini 2.0, enhance multimodal capabilities with real-time interactions and improved reasoning.

AI development has focused on unimodal models that are capable of processing only one type of data. Understanding how multimodal AI is used in generative AI can help one get the most out of the commonly used AI tools that use the power of both.



Connections refer to the complementary information shared between different modalities and interactions refer to how different modalities interact when they are brought together. Multimodal model architecture usually includes an encoder, a fusion mechanism, and a decoder.

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IT BULLETIN **Date : 10.02.2025**

EMERGING APPLICATIONS OF COBOTS

1. Traditional Manufacturing and Assembly:

Cobots are widely used in tasks like material handling, assembly, and screwdriving. Recent advancements have expanded their capabilities to include high-precision operations like polishing, sanding, and small-part assembly, making them indispensable in sectors like automotive and electronics.

2. Welding:

Amid a shortage of skilled welders, cobots have become essential. ABB's lead-through programming allows welders to guide the robot arm manually, while tools like **Wizard Easy Programming** simplify cobot setup, enabling their use in high-mix, low-volume production environments.

3. Material Handling and Palletizing:

Cobots enhance efficiency in logistics by performing picking, packing, and palletizing tasks. They complement traditional industrial robots in low-speed production lines or small-batch operations, offering a safer and more ergonomic solution for shared human-robot workspaces.

4. Quality Inspection:

Vision systems and AI have enabled cobots to perform detailed inspections with exceptional accuracy. These capabilities are vital in industries like electronics and automotive, where even minor defects can have significant consequences. **ABB's RobotStudio** further enhances quality control by simulating and optimizing inspection processes before deployment.

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IT BULLETIN **Date : 12.02.2025**

CYBER THREAT HUNTING

Step One: Form a Hypothesis

The hypothesis will be informed by analysis of previous malware attacks, trends in cybersecurity attacks, and critical areas of attack. Threat hunters must make use of threat-intelligent techniques to locate and develop a plan of action. This step is where one`s cyber threat-hunting goal is set.

Step Two: Data Collection

Threat hunting cannot be done without a sufficient amount of data collection. Cyber threat hunting should also be built on the data of previous threat-hunting exploits. This ensures that threat hunting is continuous and that only the relevant data is used to critically analyze threats.

Step Three: Critical Analysis

This step of the process is crucial and will provide the data needed to mitigate potential threats. Patterns and processes must be carefully monitored for anomalies and suspicious behaviors.

Step Four: Critical Response

This includes disabling users, implementing security patches, blocking IP addresses, updating authorization privileges, altering network configurations, or introducing new identification requirements. The main goal of threat hunting is to protect the host, prevent system damage, and eliminate the possibility of a future attack.

Step Five: Isolation and Elimination

This step sees the threat dealt with in isolation to prevent further damage to the network. Using advanced threat detection sandboxing techniques will make sure that suspicious malware is quarantined away from other files. This will reduce the risk of damage to the server and automatically mitigate the threat.

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IT BULLETIN **Date: 13.02.2025**

AI-POWERED SHOE INSOLES REVOLUTIONIZE SPORTS TRAINING AND INJURY RECOVERY

Measuring the forces between one`s feet and the ground—called ground reaction forces, or GRFs has long been important in fields like exercise science, rehabilitation, and injury prevention.

This data reveals how muscles and joints work during movement. But for years, this kind of measurement required large, expensive lab tools like force plates or instrumented treadmills. These devices work well, but stuck in labs, which means they can't help much in real-world environments like gyms, parks, or homes.

Each insole includes two main components. The first is a pressure sensor system called CapSense, which maps how pressure shifts as one moves. The second is an inertial measurement unit (IMU) that tracks foot motion through acceleration and rotation. Together, these sensors feed data into a special AI model.

The dual-stream attention model behind the system uses both types of data in real time. It automatically chooses which data stream is more useful for different parts of a person’s motion. This helps improve accuracy when predicting GRFs. In tests, the system showed a prediction error of just 4.1%. Earlier devices with similar goals had error rates between 8% and 20%, making this new model far more reliable.

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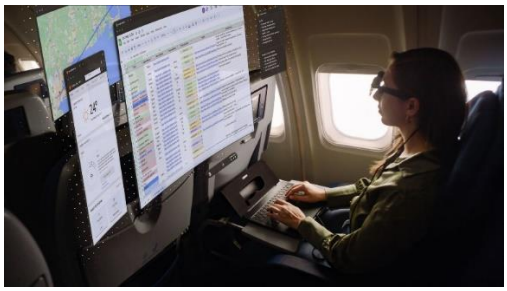
IT BULLETIN **Date: 14.02.2025**

SPACETOP G1

That's no longer the case on the G1. Now, one can fold the glasses, stow them in the dedicated cave baked into the lid, and bring the lid down. Much more intuitive. There's no neat way to store the cable, but the company insists it's intended to sit messily above the keyboard—there's a curve in the lid to accommodate the cable, ensuring it's not pressing any keys when the Spacetop is closed.

The glasses are a newer version from XREAL, but these are still customized for the Spacetop's needs. More importantly, moving from the early access model to the G1, immediately noticed the improved comfort, lighter weight, and overall better wearability of the newer model.



Boot up SpaceOS and the 100-inch virtual screen, and everything immediately feels smoother. The dual OLED displays (1,920 X 1,080-pixel resolution per eye, with a 50-degree field of view) now support a 90-Hz screen refresh rate, which helps make the content appear more fluid as one moves around the operating system. Things look pretty sharp, too, though bring text super close and it'll look a bit fuzzy.

Finally, if Control and use the three-finger gesture to swipe forward on the trackpad, can move the virtual screen upward. This let's lie down in bed and move the screen accordingly so one can continue working. It all feels quite seamless.

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IT BULLETIN **Date: 15.02.2025**

LITHELI FROZEN PACK

Key features of the Litheli FrozenPack

Wide temperature range: With an adjustable temperature range of -4F (-20C) to 68F (20C), the **FrozenPack** meets all one`s cooling needs. It chills drinks at a temperature of 77F (25C) to 32F (0C) in just 15 minutes. Even when it's unplugged, it stays cool for up to four hours, thanks to its three-layer insulation.

Two power options: When one is on the move, plug FrozenPack into one`s car's cigarette lighter for power. When one unplugs from the car, the FrozenPack draws power from a U20 IPS SUPER BATTERY. Each battery provides more than six hours of runtime, and they're swappable, so when power needs replenishing, just drop in a fully charged battery.

The versatile U20 IPS SUPER BATTERY: One of the most exciting features of the Litheli FrozenPack is its compatibility with Litheli's U20 IPS SUPER BATTERY. This battery supports all Litheli U20 series products, including brushless lawnmowers, grass trimmers, hedge trimmers, and impact drills. It can also function as a power bank for one`s digital devices such as phones and laptops, through its own USB-C port, making it a must-have for both indoor and outdoor use.

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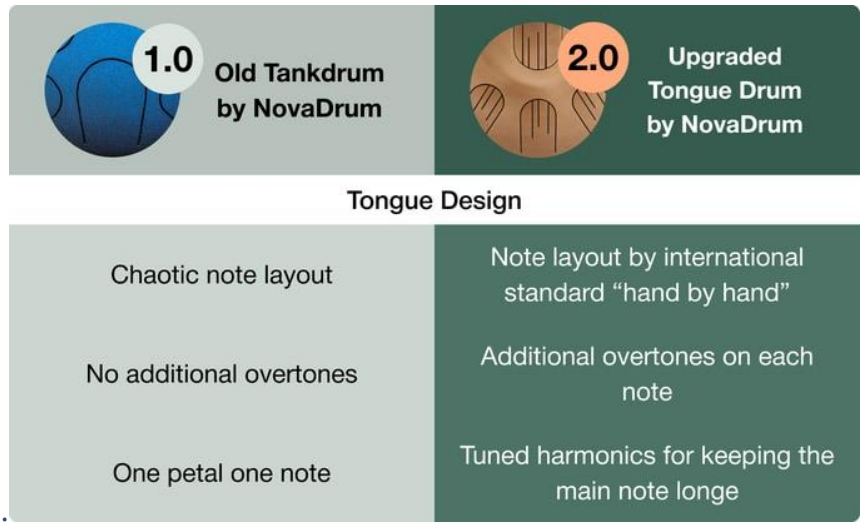
IT BULLETIN **Date: 17.02.2025**

TONGUE DRUM 2.0

Novadrum Tongue Drum is an improved and upgraded version of this musical instrument, designed to produce a **professional and clear sound.** Our aim is to make music accessible to everyone so the whole world can hear **the sound never heard before.**

An innovative development we have come to is a **double-sided Tongue Drum by NovaDrum.** Doubled number of notes, doubled potential of the sound - use it the way one likes and discover new vibrations and tunes.



Each part of the drum, called a tongue, is **finely tuned** to create a great sound. All distances are measured and calculated to achieve the best sound quality. Each tongue combines several customized harmonics, **making it unique and one-of-a-kind**. We've even **secured a patent** for this method, a testament to our pride in our **innovative approach and dedication to excellence.**

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IT BULLETIN **Date: 18.02.2025**

MAGSLEEVE WATER BOTTLE

The MagSleeve by Amphoris is a multifunctional water bottle sleeve designed to enhance convenience and organization during physical activities. It features powerful Neodymium N52 magnets that securely hold smartphones and small accessories, allowing users to keep their essentials within easy reach. The sleeve is designed to attach to a 32 oz, BPA-free, stainless steel, double-walled vacuum insulated bottle, which maintains the temperature of beverages for extended periods. This design eliminates the need for additional carrying accessories such as armbands or waist belts, providing a streamlined solution for staying hydrated and organized during workouts or outdoor activities.

In addition to its magnetic capabilities, the MagSleeve includes a multi-purpose bracket and an AirTag compartment, further enhancing its functionality. The magnetic phone pivot allows for versatile smartphone orientation, making it easier to capture workouts or stay connected on the go. The bottle's leak-proof lid and double-wall vacuum insulation ensure that drinks remain at the desired temperature, preventing spills and maintaining beverage quality. Overall, the MagSleeve offers a practical and innovative solution for individuals seeking to simplify their exercise routines and daily activities.

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IT BULLETIN **Date: 19.02.2025**

MACHENIKE KT84

Machenike, known for its high-performance hardware, has announced the release of its latest mechanical keyboard, KT84. This new model combines retro aesthetics with advanced technology, building on the foundation laid by KT68 Pro. KT84 aims to offer a blend of style and functionality tailored for tech enthusiasts and gamers.

Crafted with its LED Matrix Display, TFT HD Multimedia Screen, Volume Knob and Toggle Stick, the KT84 offers a unique blend of elegance and functionality. Featuring a compact 84-key layout, hot-swappable keys, customizable macros and music-synced RGB backlighting, it is designed to provide a customizable keyboard experience for users.

Compared to KT68 Pro, KT84 has increased the number of LED Matrix Screen pixels to 490 and added a new TFT HD Multimedia Screen. Offering users, a better keyboard and screen experience. Additionally, Machenike has developed an animation-sharing community, enabling users to share and download their pixel animations.

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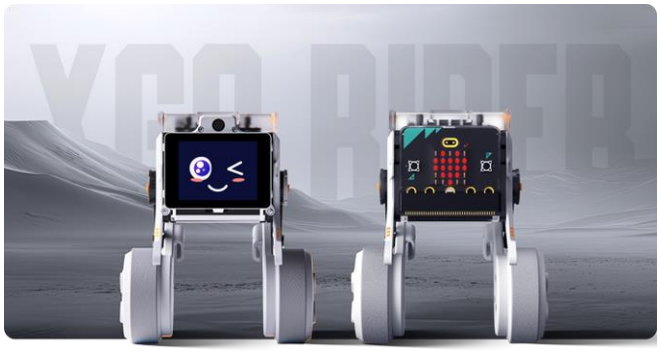
IT BULLETIN **Date: 20.02.2025**

XGO-RIDER

Built on the **Raspberry Pi CM4** core module and integrated with **ChatGPT**, XGO-Rider boasts various AI features including Gesture Recognition, Face Detection, Skeleton Recognition, and more.

A **micro:bit** version of XGO-Rider, which is built on a micro:bit motherboard and can be used in conjunction with the **Makecode/MicroBlocks** programming platform. This version is particularly suited to **children's initial programming learning**.

Equipped with a 5-megapixel camera, dual MEMS digital microphones, and a chambered speaker, XGO-Rider offers a wide range of **image and voice interactions.** XGO-Rider is integrated with **ChatGPT** voice functions, enabling free conversation.



XGO-CM4 is powered by a **Raspberry Pi Computer Module 4** (CM4) with a quad-core Cortex-A72 CPU at 1.5GHz and a 2-inch IPS screen (320 x 240). It comes with 2GB RAM, a 32GB Micro SD card, enabling **swift boot-up times** and **seamless operations**. It supports wireless connectivity through dual-band 2.4GHz/5GHz Wi-Fi and Bluetooth 5.0 BLE.

XGO-CM4 includes a **high-speed expansion interface** with 4 programmable keys, dual speaker ports, a USB 2.0 Type-C port, and a micro-HDMI port for external devices. Additionally, the 4-pin PH2.0 supports various hardware applications with **serial communication.**

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DEXPOLE FOLDING SOLAR PANEL

Outdoor adventures or those of one that stay away from the electrical grid for longer periods of time, may be interested in a new folding solar panel array created by the team at **SF Maker**. Equipped with four panels the solar array features a 24,000mAh battery and PD65W fast charging technology and is compatible with all USB devices says its creators.

Launched via Kickstarter last month the project is now coming to its end with only three days remaining, after raising over four times it's required pledge goal.

The foldable design of the DEXPOLE solar power bank is not only lightweight but also beautiful and portable. Furthermore, the advanced seamless and dustproof film coating design extends its lifespan. Using it anywhere is convenient because the minimalist design makes it look stylish, and the perfect size can be put into one`s backpack when hiking, or hung outside one`s bag when traveling outdoors.

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EXTENDED REALITY IN CONSTRUCTION

Construction professionals can leverage AR, VR, and MR, for some of the following use cases:

Improved visualization and planning. XR technologies provide immersive experiences that enable construction teams to visualize and interact with 3D models of their projects. This enhanced visualization facilitates better decision-making by identifying potential challenges, optimizing designs, and ensuring project success from the outset.

Progress capture. Mixed reality solutions can be used to track and document how projects are progressing. There are several solutions in the market that let construction pros capture project progress. These apps use your device's augmented reality features to identify where one is in the floorplan and automatically take pictures at every capture point. Doing so ensures that team members always capture at the exact same location over time, thus improving progress capture efficiency and accuracy.

Enhanced safety. XR technologies enhance safety by providing immersive training simulations and real-time hazard identification. This enables construction workers to practice and respond to various scenarios in a controlled virtual environment, reducing the risk of accidents and injuries on actual construction sites.

Construction training. When it comes to teaching people on how to use complex equipment or heavy machinery, XR can assist educators through life-like demos, so workers can see equipment in action before heading to the site. Due to its interactive and engaging nature, extended reality solutions can help demonstrate hazardous materials or situations without exposing team members to the real thing.

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POLYFUNCTIONAL ROBOTS

Polyfunctional robots are robots equipped with the capability to perform multiple tasks, often across different fields or industries. These robots are designed with modular architectures, multi-sensory inputs, and advanced software algorithms, enabling them to adjust and adapt to varied operational demands without significant reprogramming or hardware adjustments.

Types of Polyfunctional Robots

Autonomous Multi-Purpose Robots

Autonomous polyfunctional robots are equipped with Artificial Intelligence (AI) and machine learning algorithms that allow them to perform multiple tasks with minimal human intervention. These robots are widely used in logistics, where they can switch between roles such as material handling, inventory tracking, and quality control.

Modular Robots

Modular robots consist of multiple interchangeable components or modules that can be reconfigured to perform different tasks. These robots are particularly useful in industrial automation, where a single robotic system can be adapted to various production needs by swapping out different functional modules.

Humanoid Polyfunctional Robots

Humanoid robots are designed to resemble human movements and cognitive abilities. They are employed in customer service, healthcare, and research environments.

Hybrid Industrial Robots

Hybrid industrial robots combine the precision of robotic arms with mobility features, allowing them to perform both fixed and dynamic operations.

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AMBIENT INVISIBLE INTELLIGENCE

The concept of Ambient Invisible Intelligence (AII) refers to the integration of intelligent systems and technologies into the environment around us in a way that is unobtrusive, seamless, and often invisible. These intelligent systems, often powered by Artificial Intelligence (AI), sensors, and the Internet of Things (IoT), work behind the scenes to enhance everyday experiences without requiring active interaction or visibility. AII aims to create environments that are responsive, adaptive, and intuitive, making it a powerful force in various industries, from smart homes to healthcare, education, and transportation.

The Concept of Ambient Intelligence

Ambient Intelligence (AmI) is the broader term that describes the integration of AI into everyday objects and environments. It envisions a world where physical spaces homes, offices, public spaces, and cities — are embedded with computing devices and sensors that respond to the needs and behaviors of individuals. The key feature of AmI is its ability to adjust to users without direct commands, making the environment smarter and more responsive.

How Ambient Invisible Intelligence Works:

Sensors and IoT Devices: Ambient Invisible Intelligence relies on a network of sensors and IoT devices, such as motion sensors, temperature sensors, smart speakers, and wearable devices. These sensors collect data about the environment and user behavior in real-time.

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IT BULLETIN **Date: 27.02.2025**

POSTQUANTUM CRYPTOGRAPHY

Post-Quantum Cryptography (PQC) is a branch of cryptography that aims to develop algorithms and protocols capable of withstanding the computational power of quantum computers. Quantum computers utilize the principles of quantum mechanics to perform certain types of calculations at unprecedented speeds that are unattainable by classical computers. While this technological leap promises significant advancements in various fields, it poses a critical threat to current cryptographic systems, particularly those relying on the hardness of certain mathematical problems such as integer factorization and discrete logarithms.

How Does Post-Quantum Cryptography Work?

Post-Quantum Cryptography involves designing cryptographic algorithms that remain secure even when subjected to the very specific capabilities of quantum computers. Two quantum algorithms that will be able to run on quantum computers, Grover's algorithm and Shor's algorithm, highlight the vulnerabilities of current cryptographic systems:

- **Grover's Algorithm:** This algorithm can search an unsorted database quadratically faster than classical algorithms. While it doesn't completely break symmetric key cryptography, it significantly reduces the security of algorithms like AES (Advanced Encryption Standard) and SHA-2 (Secure Hash Algorithm 2), necessitating longer keys to maintain security.
- **Shor's Algorithm:** This algorithm can factorize large integers and solve discrete logarithm problems exponentially faster than classical algorithms. This poses a direct threat to asymmetric cryptographic systems like RSA, ECC, and DSA, rendering them ineffective once a sufficiently powerful quantum computer is available.

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COCONUT-HARVESTING ROBOT

Coco-bot aims to revolutionise coconut farming by making it **safer and more accessible**. “Climbing a 20-metre tree is extremely risky and physically demanding,” says Ashin, who even attempted it himself at a workshop in Thrissur. “It’s not easy, and there are no safety measures in place.”

Climbing a 20-metre-tall coconut tree isn’t just hard it’s dangerous. It takes serious skill, strength, and balance. Over time, fewer people have been willing to take up this tough job. Many farmers are stuck because they can’t find trained climbers, and even when they do, it’s not always safe or reliable. That’s where a smart little machine is stepping in *Coco-bot AI,* a lightweight robot that climbs trees and plucks coconuts like a pro.

The bot weighs less than 10 kglighter than most school bags and looks a bit like a chunky gadget with arms. It wraps around the trunk of a coconut tree and climbs up just like a human would. Once it reaches the top, a robotic arm, powered by AI, plucks the coconuts and even trims the leaves. There’s a camera feed too, so the person operating it can see what’s happening in real time. All this can be controlled using a small remote or joystick, which anyone can learn to use in just a couple of hours.

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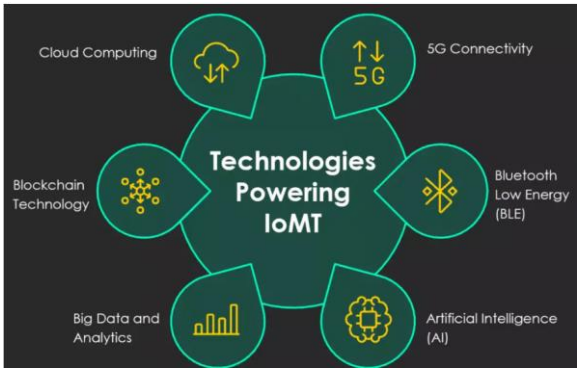
IT BULLETIN **Date: 28.02.2025**

INTEGRATION OF AI AND IOMT

The Internet of Medical Things (IoMT) is an interconnected system of medical devices and other technologies that track health parameters and monitor patients. First mentioned in 1999, the IoMT has grown to an estimated market value of 97.7% billion in 2025.

The IoMT enables patients to take tests at home, receive reminders to take medicine and allows for real-time monitoring. Wearable technologies are a central pillar of the IoMT, allowing health parameters to be recorded and shared with high accuracy. The data collected by these devices includes but is not limited to blood glucose levels, electrocardiogram readings, skin temperature and respiration rates. This makes them indispensable for tracking chronic diseases such as diabetes and predicting acute health events.



For instance, a randomized controlled trial found that daily remote monitoring of cardiovascular parameters and integrating these data within neural network modeling significantly improved risk stratification and appropriate Implantable Cardioverter-Defibrillator (ICD) treatments. Another randomized controlled trial found continuous glucose monitoring resulted in a statistically significant reduction in hypoglycemia.

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MULTIMODAL MACHINE LEARNING

Multimodal AI is a type of artificial intelligence that processes and integrates multiple types of data such as images, sounds and text at once. In machine learning, modality is a given kind of data.

Popular multimodal AI models

GPT-4o (OpenAI): This model handles text, images, and audio. It's great at blending different types of inputs during conversations, making interactions feel more natural and aware of the context.

Claude 3 (Anthropic): This model works with text and images. It's especially good at understanding visual information like charts, diagrams, and photos with impressive accuracy.

DALL-E 3 (OpenAI): Focused on text-to-image creation, this model interprets complex text prompts and produces images that capture specific artistic styles accurately.

LLaVA (Large language and vision assistant): This system merges vision and language understanding. It's open-source, which means anyone can contribute to or modify it.

PaLM-E (Google): An advanced language model that combines visual and textual data with ongoing observations like images and state information.

ImageBind (Meta): Capable of working with six modalities—images, text, audio, depth, thermal, and IMU data—this model is a powerhouse at linking and understanding multifaceted information.

CLIP (OpenAI): This model connects text with images and is known for its zero-shot learning capabilities, allowing it to handle a variety of image classification tasks without specific training on those tasks.

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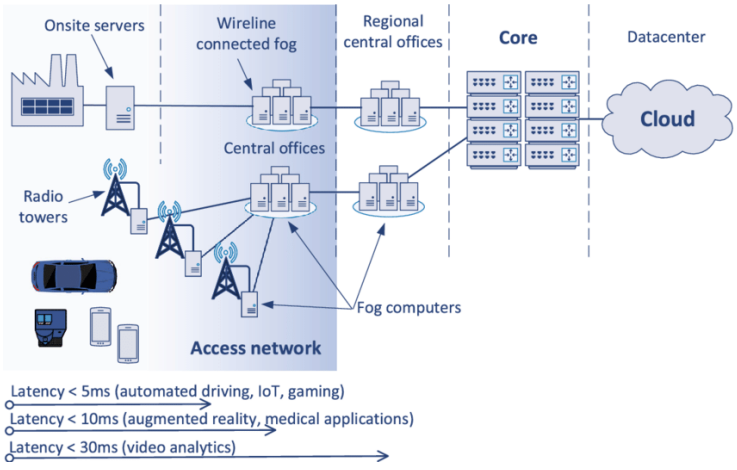
MULTI-ACCESS EDGE COMPUTING

Edge Computing is the concept of capturing, storing, processing, and analyzing data closer to the location where it is needed to improve response times and save bandwidth. Hence, edge computing is a distributed computing framework that brings applications closer to data sources such as IoT devices, local end devices, or edge servers.

Multi-access Edge Computing (MEC), also known as Mobile Edge Computing, is a key technology that enables mobile network operators to leverage edge-cloud benefits using their 5G networks.

MEC consists of moving the different resources from distant centralized cloud infrastructure to edge infrastructure closer to where the data is produced. Instead of offloading all the data to be computed in the cloud, edge networks act as mini data centers that analyze, process, and store the data.



As a result, MEC reduces latency and facilitates high-bandwidth applications with real-time performance. This makes it possible to implement Edge-to-Cloud systems without the need to install physical edge devices and servers.

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UNIFIED ML PLATFORMS AND MLOPS

An MLOps platform is a set of tools and services designed to automate and manage the ML lifecycle, from model development to deployment and monitoring. It integrates best practices from DevOps with the unique needs of ML workflows, helping data scientists, ML engineers, and operations teams to collaborate efficiently. These platforms simplify tasks such as data versioning, model training, experiment tracking, CI/CD pipelines, model deployment, and real-time monitoring.

MLOps tools vs MLOps platforms

Feature	MLOps Tools	MLOps Platforms
Scope	Focused on individual tasks (e.g., training, deployment, tracking)	Covers the entire ML lifecycle end-to-end
Integration	May require manual integration with other tools	Comes with built-in integration across components
Scalability	Limited to the tool's function	Designed for scalable, production-grade deployments
Examples	TensorFlow, Hugging Face Transformers, XGBoost	Vertex AI, AWS SageMaker, Azure ML, Domino Data Lab

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IT BULLETIN **Date: 03.03.2025**

AI VOICE CLONING

AI voice cloning is the process of replicating a person's voice using artificial intelligence. Unlike traditional text-to-speech (TTS) systems that use generic, pre-recorded voices, AI-powered voice cloning can generate speech that closely mimics the tone, pitch, and emotions of a specific speaker even with minimal training data.

At its core, voice cloning involves deep learning models trained on speech samples to understand and reproduce vocal characteristics. These models capture:

- Pitch and Tone: The natural highs and lows of a speaker's voice.
- Speech Rhythm: The pauses and speed at which words are spoken.
- Emotional Nuances: The way voice changes in different contexts (e.g., excitement, sadness).
- Pronunciation & Accent: The unique way a speaker articulates words.

Real Time vs Traditional Voice Cloning

Traditional voice cloning methods required large datasets of recorded speech and extensive training time to produce convincing results. However, with advancements in deep learning and neural networks, modern AI can now clone a voice in real time using just a few seconds of audio input.

Aspect	Traditional Voice Cloning	AI-Based Real-Time Voice Cloning
Data Required	Hours of recorded speech	A few seconds of audio
Processing Time	Several hours to days	Instant, real-time synthesis
Customization	Limited and rigid	Highly flexible and adaptive
Emotional Expression	Often robotic and monotone	Can replicate emotions and tone

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TYPES OF AI IN GAMES

1. Rule-based AI

Rule-based AI operates on a set of predetermined rules and conditions that dictate the behavior of non-player characters (NPCs) within the game. These rules are usually programmed by developers and define how NPCs should react in various situations. For example, in a stealth game, if the player is spotted by an NPC, the rule-based AI might instruct the NPC to alert nearby guards.

2. Finite State Machines

Finite State Machines (FSMs) model NPC behaviors by breaking them down into distinct states and transitions between those states. Each state represents a specific behavior or action. Transitions occur in response to certain triggers or conditions. For instance, in a combat scenario, an NPC might transition from a "patrolling" state to an "alert" state when it detects the player.

3. Pathfinding AI

Pathfinding AI focuses on determining the most optimal path for NPCs to navigate through the game environment. Algorithms like A* (A star) are commonly used to calculate the shortest path while avoiding obstacles. This technique ensures that NPCs move intelligently and realistically through complex environments.

4. Behavior trees

Behavior trees offer a more flexible approach to AI behavior. They consist of a hierarchical structure of nodes representing specific actions, conditions, or states. These nodes are interconnected to form a tree that outlines the possible behaviors of an NPC. Behavior trees allow for complex decision-making, enabling NPCs to adapt to changing conditions dynamically.

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