

ETC@USC

CES 2022 REPORT

Loud Ideas

Beyond the hype of the Metaverse is a transformational future. Now is the time to get ready

Quiet Show

Quiet by comparison, with 75% fewer people and scaled down exhibits, CES was still the center of the innovation

What's New

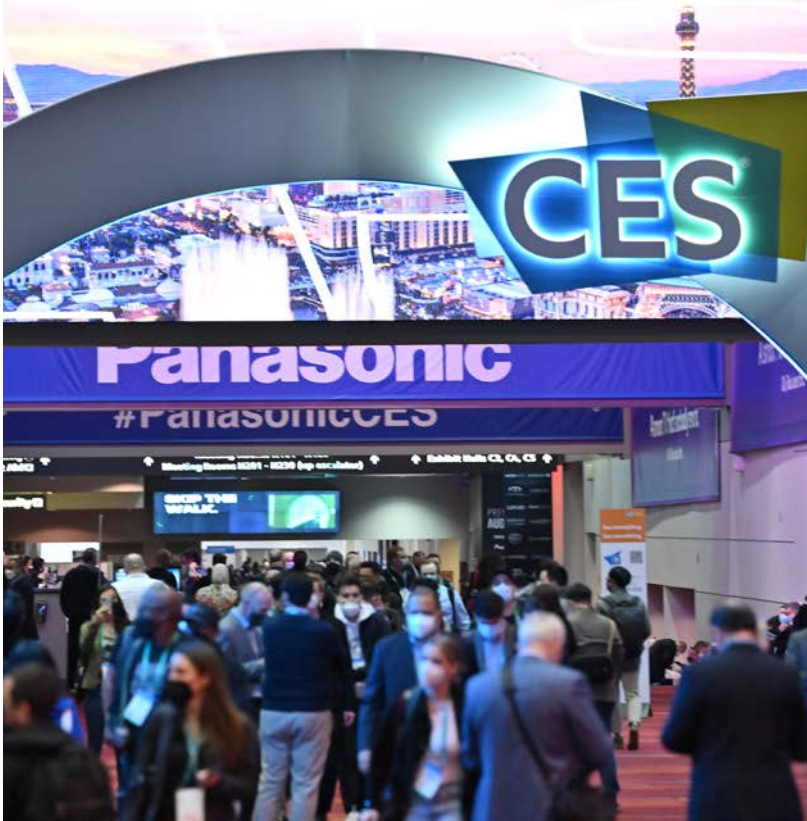
Bigger, brighter, better familiar objects, and new approaches in consumer electronics suggest change

CES 2022: Aspiration and Inspiration for a Better Tomorrow



The SK Green Forest Pavilion, where the Korean corporation announced a pledge to reduce 200 million tons of carbon emissions across its 120 operating companies by 2030.





ENTERTAINMENT TECHNOLOGY CENTER@USC

CES 2022 REPORT

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Links to over 200 articles and reports curated by ETC

Consumer Technology Association (CTA) released a study showing significant increase in the average share of time consumers spend viewing Traditional Studio Media VS User Created Content. It is nearly a 60/40 split with User Created Content Rising.

CTA SURVEY • WEEKLY CONTENT CONSUMPTION AVERAGE % SHARE OF CONTENT HOURS

Traditional Studio Media

20%

Watching Video content on subscription-based apps

18%

Watching traditional TV content

15%

Listening to streaming music from popular artists

7% 60%

Listening to audio content/podcasts from studios & publishers

User Created Content

16%

Watching user created video content

9%

Watching user created gaming content

6%

Listening to user created audio content & podcasts

4%

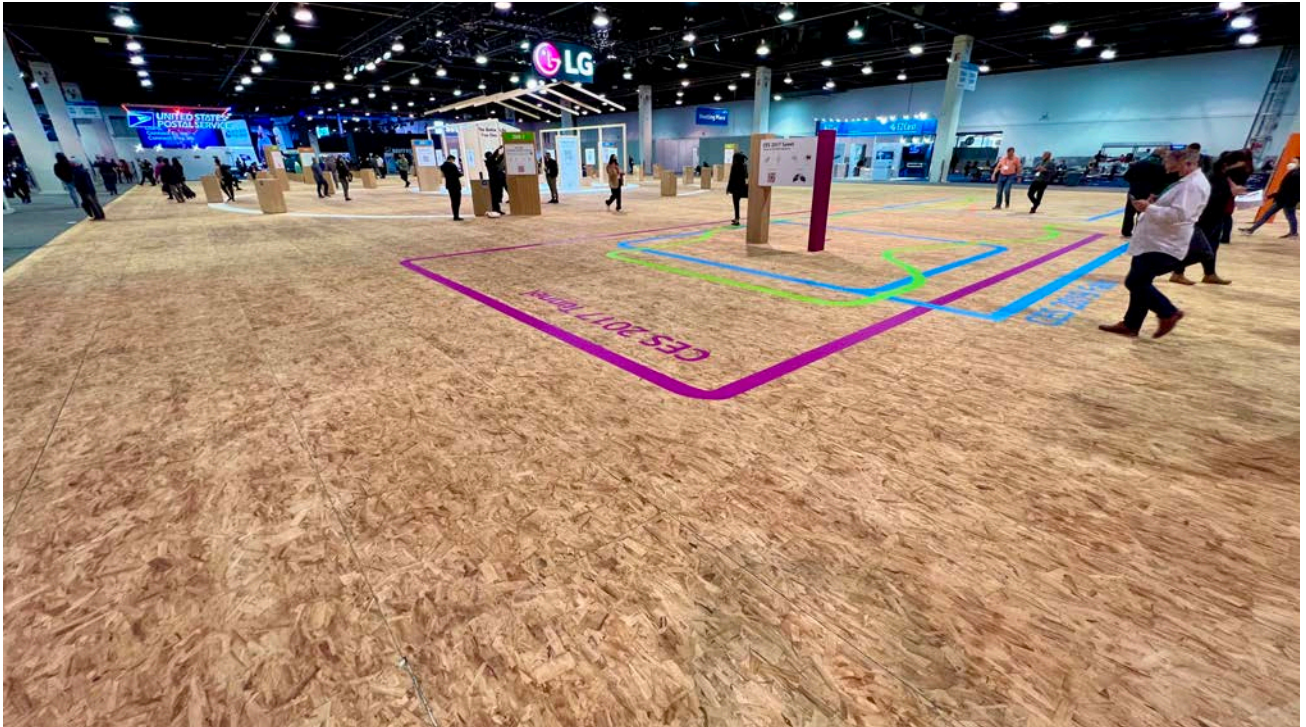
Listening to user created music content

4% 39%

Playing user created gameplay content

The Survey Provided a Nationally Representative Panel of U.S. Consumers Who Have a Mobile Phone, According to the Trade Group. The Margin of Sampling Error at 95% Confidence for Aggregate Results Is +/-3%





The LG Booth in Central Hall re-imagined their stripped down presence by outlining floor plans from recent years and the products they introduced.

About this Report

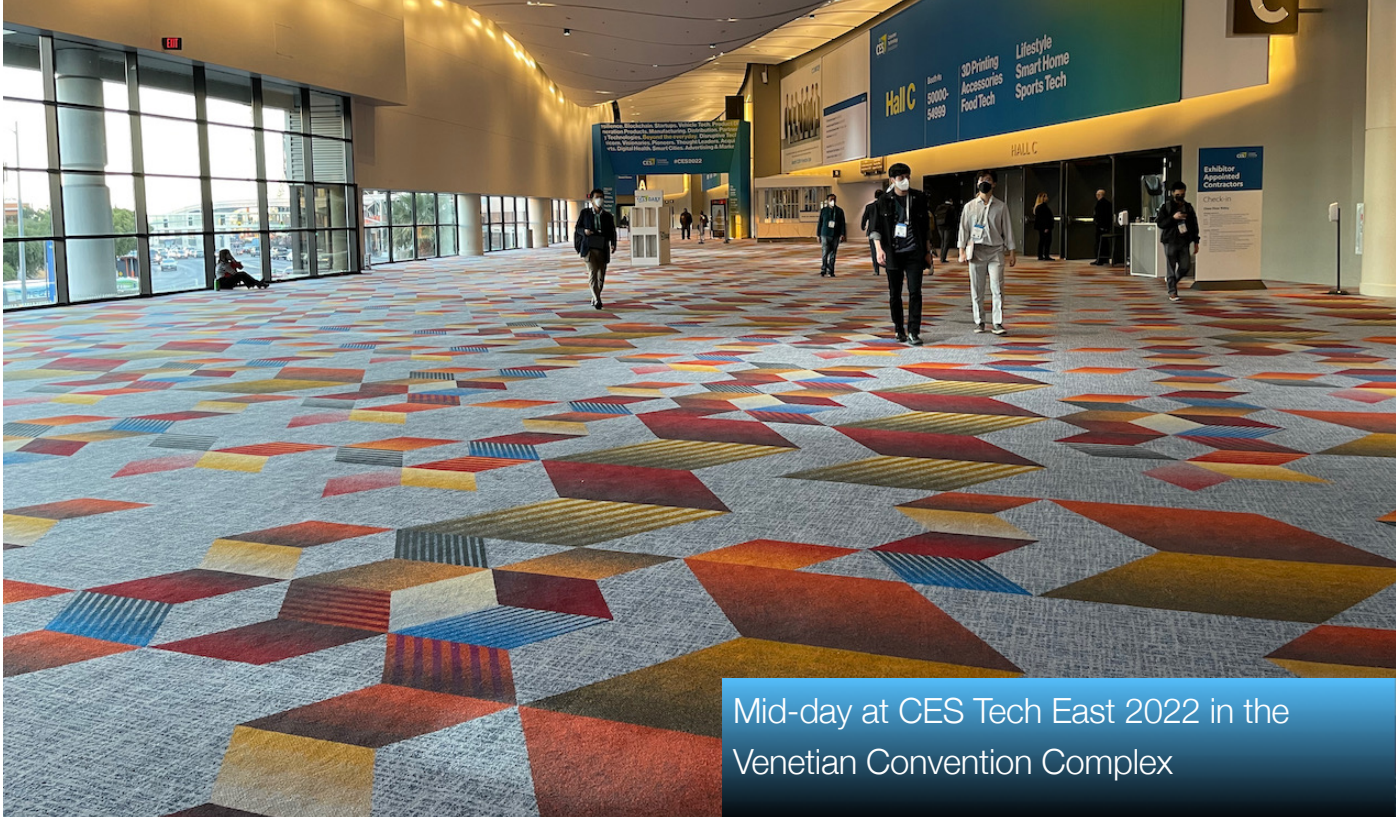
The 2022 CES Report is presented by the Entertainment Technology Center at the University of Southern California (ETC), a research center and think tank organized within the School of Cinematic Arts. Find more Information at etccenter.org, read the latest industry technology news at etccentric.org, and subscribe to our free [Daily News Brief](#). Our reporting from CES 2022 presented here, and in a narrative presentation by ETC analysts that becomes available after the completion of a series of live-on-site briefings, highlights products, technologies, companies, issues, and trends important to media, entertainment, and technology companies.

About ETC@USC

The Entertainment Technology Center at the University of Southern California is a think tank and research center that brings together senior executives, innovators, thought leaders, and catalysts from the media & entertainment, consumer electronics, technology, and services industries along with the academic resources of the University of Southern California to explore and to act upon topics and issues related to the creation, distribution, and consumption of entertainment content. As an organization within the USC School of Cinematic Arts, ETC helps drive collaborative projects among its member companies and engages with next generation consumers to understand the impact of emerging technology on all aspects of the media and entertainment industry, especially technology development and implementation, the creative process, business models, and future trends. ETC acts as a convener and accelerator for entertainment technology and commerce through research, publications, events, collaborative projects and shared exploratory labs and demonstrations.

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Mid-day at CES Tech East 2022 in the Venetian Convention Complex

ENTERTAINMENT TECHNOLOGY CENTER / CES 2022

LOUD IDEAS FROM A QUIET SHOW

Don't let the absence of people fool you. There were plenty of ideas not only on display at CES 2022 but even more to suggest and inspire what comes next.

Metaverse is the “.com” of 2022, capturing the hype-cycle like it was 1999. While there was little to report in actual products, you could see 30 years of maturing technologies and innovations beginning to come together.

After going all virtual in 2021 due to the COVID-19 pandemic, CES 2022 was set to return in person as the global center of innovation and technology. But the surge of the Omicron variant in December forced an abrupt change of plans. Exhibitors scaled back or pulled out. Conference sessions and keynote presentations went virtual or hybrid. So abrupt was the shift that CES had only limited plans to stream conference sessions and quickly scrambled to make more available.

CES normally attracts as many as 175,000 people to its acres of exhibit space. The real estate was still extensive, including the newly opened West wing of the Las Vegas Convention Center, but fewer than 50,000 made the trip. Thanks to keynote company Abbott and robust COVID protocols, all onsite had to test negative, prove vaccination status, and be masked at all times. It is likely a presage to large, international gatherings ahead.

The pages that follow go beyond the broad themes of the Consumer Technology Association (CTA) to identify products, trends, and ideas of particular interest to media and entertainment companies.



ETC TRENDS AND FOCUS

Against the backdrop of traditional consumer electronics, transitional products, and emerging technology, ETC identified four areas of activity that merit extra attention.

Rather than a singular, encompassing Metaverse, ETC sees many “verses” in the future. **Multiverses** old and new evolve as companies will build out the future.

Augmented Reality is poised for wider consumer adoption. Commercial applications have gained acceptance, eyewear is vastly improved, and several products suggested that eyeglass and contact lenses are around the corner.

NFTs show potential to become a backbone of CRM and understanding for commercial, marketing, and experiences. While ownership prompts a need for object storage and archives as new value chains develop.

Artificial Intelligence in sound and image production is seen in practical applications for content creation and distribution. For all its benefits, it may also raise some concerns as AI assistance becomes more common.

TOPICS

Excerpts from ETC reporting.
Click titles to read full stories.

Social Audio

The voice could be described as the original mass media and, as social audio, it is now the latest trend. United Talent Agency executive director of audio Kristin Myers moderated a CES 2022 panel discussion on the topic with Clubhouse head of community and creators Stephanie Simon and Audio Collective co-founder Toni Thai Sterrett, who offered up the definition of social media as “live group audio.” “And the key is the sense of participation and interactivity,” she said. Simon added that, “we’re social media based on audio.”

The ABC's of NFT

CES held its first-ever panel discussion on NFTs – non-fungible tokens for the uninitiated – with two experts who have grown up with the nascent industry sector. United Talent Agency head of digital assets Lesley Silverman noted that her company established the new division in March 2021. Her guest was Art Blocks founder and CEO Erick Calderon, who first got involved with NFTs in 2017 by following a thread on Reddit. Both had advice for newbies: Don’t let the jargon intimidate you and store your seed phrase in a cold storage device.

Mobility Going Places

Sony raised the curtain on its smart car efforts at CES 2022. “In order to further accelerate and make new proposals that further evolve the mobility experience, Sony will establish an operating company, Sony Mobility Inc., in the spring of 2022, through which the company intends to explore entry into the EV market,” CEO Kenichiro Yoshida said in the Sony press release. There is speculation that Sony may announce a partnership with a traditional manufacturer. “With our imaging and sensing, cloud, 5G and entertainment technologies, combined with our content mastery, we believe Sony is well-positioned as a creative entertainment company to redefine mobility,” said Yoshida.



Multiverses Are Old & New

This is a trend that has been growing for 30 years and already exhibited in many ways. Many of the images presented at CES were more marketing overreaches than forecasts.



AR Soon To Go Public

The bits and pieces necessary to construct consumer acceptable AR glasses and eventually perhaps contacts are advancing. Commercial uses are now acceptable and were advanced at CES 2022.



NFTs & Value of Object Storage/Archive

Present in a range of examples NFT's potential to become a backbone of CRM and understanding for commercial, marketing and experience are really just beginning to be explored.



AI in Sound & Image Production

Impacts to production and distribution of image and sound is already being impacted but we will soon see a wide range of assistance and some concern as both are altered at start and finish.



CES 2022: Top Trends To Watch



Transportation

Electric Vehicles
Micro-mobility Solutions
21st Century Logistics



Space Tech

Commercial Applications
Communications
Tourism?



Sustainable Technology

Alternative Power Sources
Food Tech
Smart Cities
Smart Home



Digital Health

Wearables
Mental Wellness
Therapeutics
Provider Solutions



CES TECH TRENDS TO WATCH

By Debra Kaufman

According to CTA vice president of research Steve Koenig's "Tech Trends to Watch" presentation at CES in Las Vegas, developments in 2022 will emerge from the transportation, space tech, sustainable technology and digital health sectors.

Innovations will include electric vehicles, micro-mobility solutions and space tourism as well as alternative power sources, smart cities and homes and, in digital health, an increased use of wearables as well as an emphasis on

solutions for mental health. Last year also saw historic highs of consumer demand in a wide variety of sectors.

Koenig noted that, as he predicted at CES 2021, this year of crisis has unleashed an abundance of innovation. He also revealed that the CTA's just-released U.S. Consumer Tech Industry Forecast predicted that over half a trillion dollars in consumer retail spending is expected in 2022. "That's a huge number and a huge high for the industry," he said. "We

can't hit these historic highs forever but even as we get back to a more normal growth rate of about 3 percent expected this year, it's still good."

He listed three "core fundamentals" that will support continued growth in the U.S. and globally. The first is that consumers are "leveling up their tech" by buying more "smart technologies." Second is a trend towards consuming premium experiences. "Tech and durables are on the road to premium after

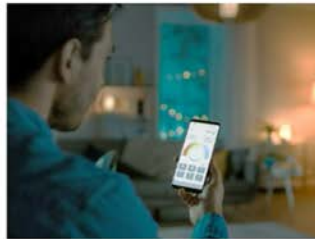


The Great Home Makeover



Enhanced Home Theater

Traditional Devices for
Non-Traditional Use
OLED
Mini-LED
Spatial Audio



Smarter Home

Design
Energy Efficiency
Healthy Home
DIY Installations



Pursuing Premium

Leveling Up
Optimizing for New Normal
Pent-Up Demand



Consumers are leveling up, enhancing home theater experiences with bigger and more brilliant screens and spatial audio

MORE: CES TECH TRENDS TO WATCH

simmering for more than a decade,” he said. Third is a focus on services that “have become very important to the industry and very important to consumers.”

He showed the numbers of SVOD subscribers at Netflix (214 million), Amazon’s Prime Video (175 million), Disney+ (188 million) and Apple TV (20 million), adding that, in the U.S. and Europe, “a strong proportion of consumers have adopted new services.” CB Insights also reported that investors leaned into technology startups in the last year.

Supply chain issues and a shortage of microchips have been chief challenges. Intel, Samsung and TSMC are on track to expand chip capacity, but Koenig pointed out that

building a new fab can take two to three years, meaning that capacity will remain vulnerable until they open.

Going into 2022, 5G will be the connective tissue, said Koenig, noting that standards group 3GPP will publish protocols and requirements for industrial IoT applications, which will open the floodgates to new case studies. Another “key ingredient technology” for 2022 will be AI, which will impact all sectors.

Koenig pointed to the metaverse as another trend that is “closer than you think.” “All the building blocks are already present and in play — cloud, 5G, haptics, volumetric video,” he said. “Now it’s about assembling them into an experience. The metaverse is the next generation Internet that will provide immersive digital



experiences which will become inextricably linked with our physical reality. For now, it’s an evolving story.”

He also addressed the evolution of VR, which started with enthusiasm for consumer use cases. “But we’ve seen over time that the real value has been in the enterprise market,” he said. “The metaverse may also evolve that way.”





CTA CES RECAP

From the Consumer Technology Association

CTA Wrapped Up its Show With this Recap

CES 2022 concluded today, following a week filled with thousands of product debuts unveiling innovation that will better the world and solve global challenges. More than 2300 exhibiting companies from around the world, including more than 800 startups, launched products featuring innovation across artificial intelligence, automotive technology, digital health, smart home and more. After nearly two years, CES returned 'home' to Las Vegas welcoming well over 45,000 attendees in person, including 1800 global media, across 11 indoor and outdoor venues. The show was truly a global event, with 30% of

attendees traveling from outside the US – representing 119 countries.

"Innovation came to life this week at CES 2022 – with technologies that will reshape industries and provide solutions to pressing worldwide issues from healthcare to agriculture, sustainability and beyond," said Gary Shapiro, president and CEO, Consumer Technology Association (CTA), owner and producer of CES. "The CES show floor buzzed with the joy of human interaction and a five-sense innovation experience with products that will redefine our future and change our world for the better."

"CES 2022 furthered global business this week, as our industry

gathered – many for the first time in two years – to collaborate, forge partnerships, make deals and advance the economy," said Karen Chupka, EVP, CES. "After two years of not being able to connect in person, we were thrilled to welcome our industry back together again face-to-face to experience the latest innovation at CES 2022."

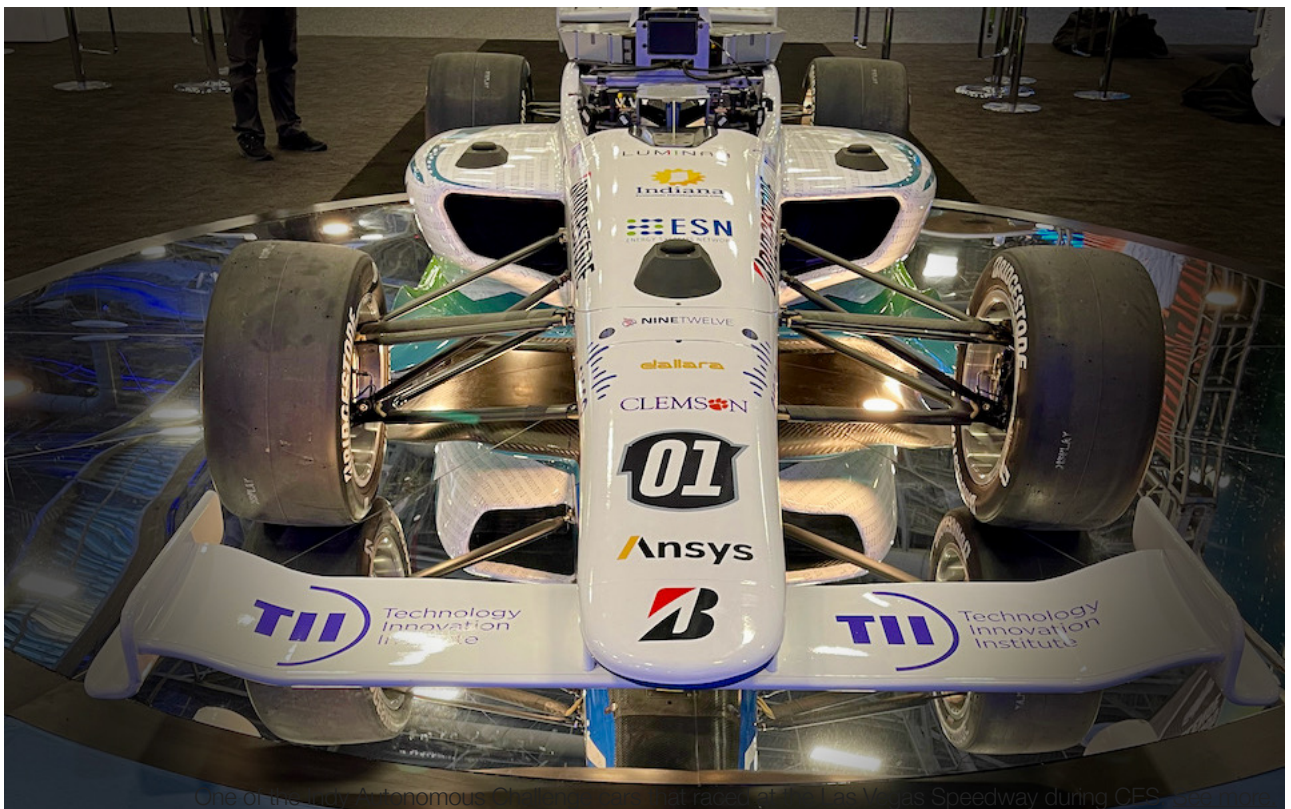
KEY TRENDS AT CES 2022

CES 2022 featured transformative technologies that will spur business and shift markets.

Automotive Technology

Vehicle technology was front and center at the show, with more than 190 automotive companies exhibiting, with companies including [BMW](#), [Hyundai](#), [Indy Autonomous](#)





CTA CES RECAP

Consumer Technology Association

Challenge, Stellantis and VinFast, Vietnam's first automaker.

Digital Health

The latest in telemedicine, connected health devices and improved health features on wearables were highlights, allowing consumers to take better control of their own health with exhibitors such as Abbott, Essence and Baracoda Daily Healthtech.

Artificial Intelligence

Prevalent throughout the show was artificial intelligence, making products and technologies smarter, more efficient and customizable, advancing nearly every major industry from agriculture to healthcare, automotive, manufacturing and entertainment. Companies included John Deere, featuring the first fully autonomous tractor, and Beyond Honeycomb, with an AI-enabled

robot to prep and cook customizable meals.

Startups

More than 800 startups from 19 countries were featured in Eureka Park, the startup hub for CES 2022, including the SkyDrive air taxi; ScenTronix with its Every Human algorithmic perfumery and Orbisk, an AI-powered fully automated food waste monitoring system. The Venetian Expo also featured a first-time European Pavilion highlighting the latest tech advancements from Europe.

Keynotes

The CES keynote stage featured leaders across global industries. Top executives delivered addresses including J.H. Han, Vice Chairman, CEO and Head of DX (Device eXperience) division

at Samsung Electronics; Mary Barra, chair and CEO of General Motors and Robert B. Ford, president and CEO of Abbott, the first healthcare keynote in CES history. Emmy-award winning FOX Business anchor Liz Claman and owners of Sierra Nevada Corporation (SNC), Eren and Fatih Ozmen, spoke during the CES Leaders in Technology Dinner.

Attendance

With more than 45,000 attendees, CES 2022 was able to successfully gather the industry together in person with praise from the US Travel Association on the show's protocols. Health protocols were put in place for in-person attendance, including proof of vaccination, required masking indoors, testing and social distancing measures.



KEYNOTES

CES Keynotes in 2022 were unexpectedly different, quickly shifting to a virtual or hybrid format and missing the energy of an audience. In a sign of Covid times and the overall growth of the Digital Health segment at CES, Abbott Laboratories became the first health care company to deliver a CES keynotes

(Click images to play)

CTA State of the Industry and General Motors Keynote

General Motors Chair Mary Barra outlined a future of zero emission EVs and emphasized the Ultifi software platform to keep GM drivers connected during her virtual CES keynote that centered on the 2024 Chevrolet Silverado EV and ended with futuristic Cadillac concept vehicles including air transport.



Abbott Labs

"Technology gives us the power to digitize, decentralize and democratize healthcare, create a shared language between you and your doctor – and put more control of your health in your hands," said Chairman and Chief Executive Officer Robert B. Ford. "We're creating a future that will bring you and your loved ones care that's more personal and precise. It's happening right now. And its potential is no less than incredible."



Samsung Keynote

As the first keynote of CES 2022, Samsung's Vice Chairman, CEO and Head of Device eXperience (DX) Jong-Hee (JH) Han was welcomed to the stage with a fist-bump from CTA President and CEO Gary Shapiro. Han opened with a focus on "everyday sustainability," emphasizing even incremental steps can lead to big change.



CES 2022

ALL CES 2022 VIDEOS

99 Videos

CES 2022

C SPACE STUDIO

36 Videos

CES 2022

KEYNOTES

6 Videos

CES 2022

SHOW HIGHLIGHTS

6 Videos

Click on any of these banners to access conference session videos and highlights from the show floor.

C Space, where media and marketing take center stage, featured sessions on talent, brands, NFT's, content creation, AI, data, and research.

The Solving for Tech sessions explored a variety of topics, including Decrypting Crypto, FinTech, Experiential Retail, Social Shopping, and Game Health.





ENTERTAINMENT TECHNOLOGY CENTER / CES 2022

TRADITIONAL CE

For a quiet year and minimalist exhibits, there were some remarkably brilliant displays.

Among the highlights of CES's Central Hall were a Hisense ultra-short throw projection TV, a Samsung TV with an adjustment capability that would be useful in-camera as well,

Hisense showed a 120-inch ultra-short throw projection TV that utilizes three laser technology (RGB) and delivers 100 percent BT 2020 coverage (good for HDR), and 4000 ANSI lumens (screen brightness up to 430 nits). One attendee described the colors as "insane!" The projector has a built-in Harman Kardon customized audio solution with rollable speakers and a

separate wired subwoofer. We take this as evidence that Hisense is now designing products that compete with the top tier of consumer electronics brands. Even more impressively, the projection TV has

built-in blending projection display technology that supports NxN multi-screen blending. Hisense showed two L9 120-inch projection TVs side-by-side that seamlessly blend into one ultra-wide display.





Samsung

Samsung announced a dazzling lineup of TVs at CES 2022, including the ultimate MicroLED, which one writer called “110 inches of entertainment insanity,” with a \$150,000 price tag to match. The Neo QLED line and Lifestyle TVs also impressed. [Read More](#)



Sony Bravia XR with Bravia Cam

Sony is adding camera functionality to models in the 2022 Bravia XR lineup. The Z9K Mini-LED (8K) and A95K HDR OLED (4K) will ship with Bravia Cam, which adds video chat and gesture control. The camera will also help with brightness settings, dialogue emphasis and sound balance the viewer's position with regard to the screen. [Read more](#)



LG OLED EX

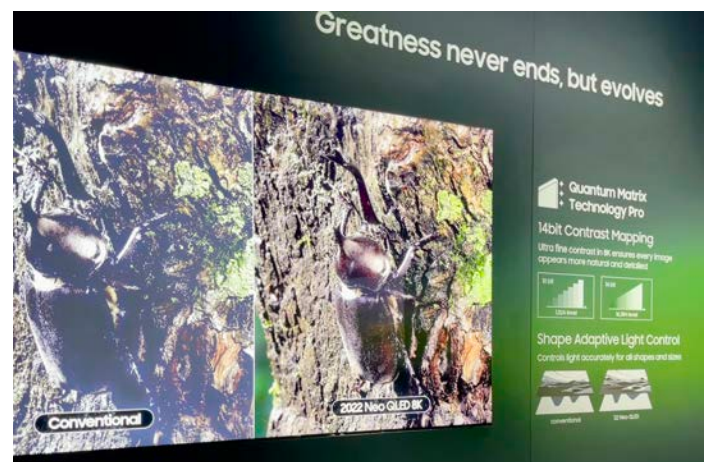
LG Display is rolling out its next generation in OLED technology, OLED.EX, which the company says will “enhance brightness up to 30 percent compared to conventional OLED displays.” The name is an acronym of “Evolution” and “eXperience,” and LG is tapping both to improve what is considered OLED’s weak link: lack of brightness compared to more expensive Mini LED displays. [Read More](#)

TRADITIONAL CE (CONT.)

Hisense also showed a ULED 8K display (model U800) with quantum dot color, full array local dimming, and Dolby Atmos. The company’s 8K variant of the TriChroma TV is powered by an 8K imaging chipset with embedded artificial intelligence that combs through every visual scene pixel by pixel to optimize the picture, and also hosts 20,000 mini-LED partitions to enhance definition and contrast. This display is probably more for the professional market than the consumer market.



One of the new extras in Samsung’s 2022 Neo 4K and 8K QLED line is Shape Adaptive Light Control, which reduces stray illumination by analyzing on-screen objects and shaping the light to match. Another, called Object Depth Enhancer, employs more processing to further distinguish the objects from the background. (For more details, check out the [CNET coverage](#).) We believe that this ability to micro-correct the image could be extremely useful to the professional community if it becomes available in-camera or in post applications.



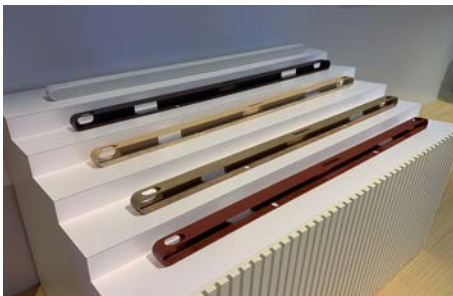
Samsung has noticed a new emerging market, and is pitching its 8K panels as good platforms for showcasing your NFTs. “The platform, which will be available on Samsung’s MicroLED, Neo QLED and The Frame models, allows users to browse and buy NFTs directly from





Personal Portable Projector

The Samsung Freestyle is portable battery-compatible projector featuring 360 degree sound and Full HD images sizes from 30 to 100 inches. At CES, they showed it in small apartments and campsites, turning almost anything or space into a screen. Works with voice assistants and Samsung Smart TV.



Samsung HW-Q990B

The beautifully trim 11.1.4-channel system with up-firing and side-firing speakers in the HW-Q990B soundbar as well as discreet rear speakers with up-firing and side-firing units can be tailored to room decor with "bespoke" covers. A new subwoofer with passive radiator completes the sonic package. Supports both Dolby Atmos & DTS:X.



QD-OLED 65"

Samsung's 65" QD-Display TV is the world's first true RGB self-emitting Quantum Dot OLED display — revolutionizing TV by combining the contrast levels of RGB OLED with the color and brightness of quantum dots for ultimate visuals. It won a CES Innovation Award.

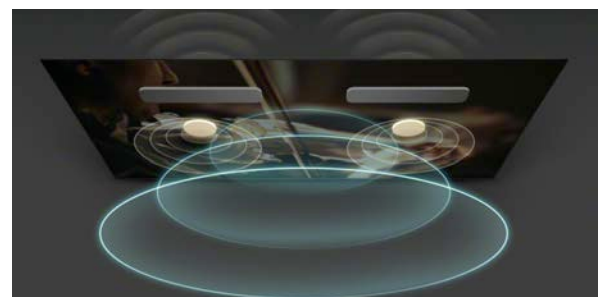
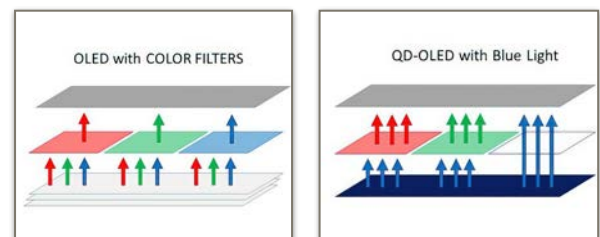
TRADITIONAL CE (CONT.)

their sets," reports *Engadget*. "The platform pulls in NFTs from several marketplaces, so users can preview the art and see other relevant details, like who created the work, as well as relevant blockchain metadata."



Sony and Samsung Show Significant Advances in OLED

Sony and Samsung announced a significant advance in the display technology that both companies source from SDC (Samsung Display). A hybrid approach uses the additional brightness of Quantum Dots with the internal luminous properties of OLED to produce beautiful OLED Black Levels and much higher illumination levels without white pixels.



Sony's Master Series A95 65" QD OLED with Acoustic Surface Audio+

Sony's QD OLED features Sony's Acoustic Surface Audio+ for direct screen sound origination. Acoustic Center Sync synchronizes BRAVIA XR TVs speakers with select Sony soundbars to reinforce the center speaker channel for fuller, more immersive sound.



ETC REPORTS

Samsung Promises QD-OLED Details

Samsung announced a dazzling lineup of TVs at CES 2022, including the ultimate MicroLED, which one writer called “110 inches of entertainment insanity,” with a \$150,000 price tag to match. The Neo QLED line and Lifestyle TVs also impressed. [Read More](#)

LG Display Touts Next-Gen OLED and Curved Screens

LG Display is rolling out its next generation in OLED technology, OLED.EX, which the company says will “enhance brightness up to 30 percent compared to conventional OLED displays.” [Read More](#)

Sony Touts 8K, QD-OLED TVs, Bravia Cam for Gestures

TVs continue to gain computer functionality as Sony borrows a page from the monitor playbook by adding camera functionality to models in the 2022 Bravia XR lineup introduced at CES 2022. The Z9K Mini-LED (8K) and A95K HDR OLED (4K) will ship with Bravia Cam, which adds video chat and gesture control. The camera will also help with brightness settings, dialogue emphasis and sound balance by tracking the viewer’s position with regard to the screen. [Read More](#)

Hisense Debuts NextGen Sets, Cars Plan for ATSC 3.0

NextGen broadcast TV, also known as ATSC 3.0, is progressing more rapidly than predicted, with coverage in more than 40 markets that account for approximately 45 percent of the nation’s population, with a summer household target of 75 percent reach, according to Pearl TV, a coalition of U.S. broadcasters fueling the advance. The debut at CES 2022 by Chinese manufacturer Hisense of its first ATSC 3.0 TV sets — joining LG, Sony and Samsung — was well-received, as were showcases for ATSC 3.0 automotive broadcasts and fabless semiconductor firm MediaTek’s steps to hasten market delivery times for new ATSC 3.0 TV sets. [Read More](#)

TCL 8K QLED X925 Pro Comes in a Very Thin Package

TCL, the No. 2 TV-maker in the world after Samsung, raised the curtain on a new flagship model. The X925 Pro is a super-thin, 85-inch, 8K Google TV powered by the company’s own flavor of Mini-LED, featuring OD-Zero technology. Just 10mm thick — half that of some competing models — the 8K display has local dimming, QLED color, a built-in webcam for video chats, 120Hz refresh rate and, to make gamers happy, variable refresh rate (VRR). The Google TV OS enables hands-free “Hey, Google” voice commands. The X925 Pro touts numerous high-end touches and has a \$10,000 price to match. [Read More](#)

Samsung Reveals Gaming Hub, 55-Inch Curved Monitor

Samsung introduced its largest curved monitor ever, the 55-inch Odyssey Ark, which will come with a special stand, enabling it to rotate vertically when it is released Q3. The flexible and curved gaming screen debut came at the end of Samsung’s Gaming Hub presentation at CES, although immersive lifestyle applications (like workouts and movies) were also demonstrated in a socially responsible keynote themed “Together for Tomorrow.” The Gaming Hub will come with select 2022 Samsung monitors and TVs, and will include access to the cloud libraries of Nvidia GeForce, Google Stadia, Utomik and others as part of Samsung’s Bespoke smart TV menu due later this year. [Read More](#)

LG Electronics Promises ‘The Better Life You Deserve’

With a focus on sustainability, accessibility and personalization across its offerings, LG Electronics debuted a suite of smart TVs and appliances. Company chief executive William Cho, who hosted a press conference at CES 2022 today in Las Vegas, emphasized “an enhanced lifestyle and a better future for all.” “We have stories about innovation and progress and also about values that never change,” he said. Futuristic products included CLOi, a door-to-door delivery robot and LG OMNIPOD, a mobile office for autonomous vehicles. [Read More](#)

TV, Audio and Drone Tech Make a Splash at Central Hall

ETC’s George Gerba and Don Levy spent Thursday navigating the Las Vegas Convention Center’s Central Hall looking for unique products from major exhibitors at CES 2022 that would be of special interest to the entertainment industry. They found a Hisense ultra-short throw projection TV, a Samsung TV with an adjustment capability that would be useful in-camera as well, Fraunhofer tech for adjusting the volume of dialog separately from other audio in a consumer device, a winged drone with impressive flight duration and speed, and a few other products of note. [Read More](#)

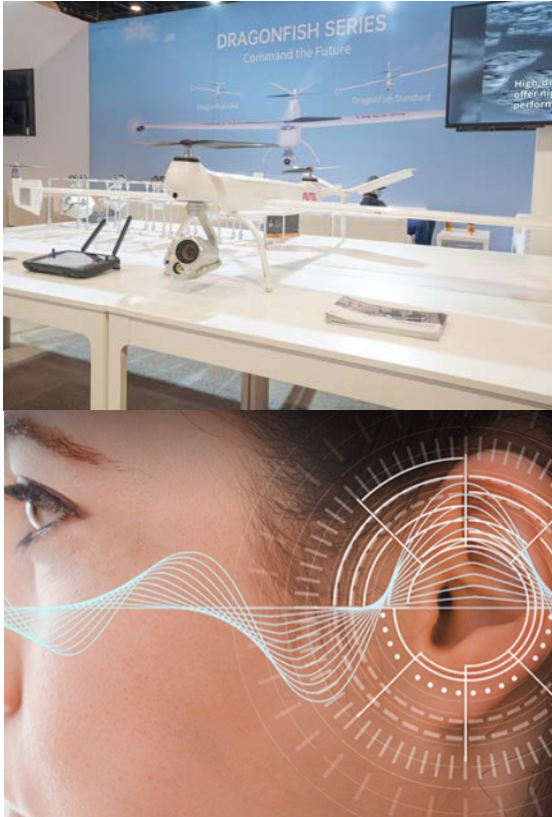
CES: Samsung Reveals Its Latest Smart TVs and M8 Monitor

Samsung is heading to CES this week with new smart TV features including its Gaming Hub and an NFT platform that integrates the purchase and trade of digital art and assets. The company is also introducing the 4K 32-inch M8 smart monitor, which like the M7 combines computer functionality with smart TV features such as preloaded streaming apps but bests its predecessor by adding a SlimFit camera for video calls and a SmartThings IoT hub that maps smart devices throughout the household and lets you control them from the monitor. The M8 price and release date has yet to be announced. [Read More](#)

Highlights from the 2022 CES Unveiled Pre-Show Event

ETC’s George Gerba visited the CES Unveiled show floor in Las Vegas Monday evening looking for companies and products that would be of interest to our members, illustrate emerging trends, or are simply unusual. Gerba discovered a range of compelling technologies across areas such as blockchain, non-fungible tokens, Li-Fi, wearables, large-scale video screens, the metaverse, remote work, cell signal boosters, health, batteries and more. Among the more interesting companies at CES Unveiled this year were Icecap, Oledcomm, Somalytics, Videowindow, Toraru, SureCall, Biospectral, Prinker, Airxom and Nanotech Energy. [Read More](#)





ENTERTAINMENT TECHNOLOGY CENTER / CES 2022

TRANSITIONAL CE

New approaches and evolving technology suggest crossover products and change. Spatial audio is just one example. So, too, are drones, 5G, and the universal screen description that is the basis of Nvidia's Omniverse.

As ETC's George Gerba wrote in a CES preview, the entertainment industry has traditionally piggybacked on primary development in other sectors to fuel our own innovative adoption of practical and compelling technologies. History shows that we consistently benefit from numerous advances across industries for reuse or adaption in our key areas ranging from internal adaption in our key areas ranging from internal communication all the way to distribution of content.

Software skeletal joint studies became the start of figure animation and motion capture. A steady advance in the density and dynamic range of panels currently fuels advances in virtual production of all scale and stages. Bottom-up development of consumer level products might soon become an increasingly

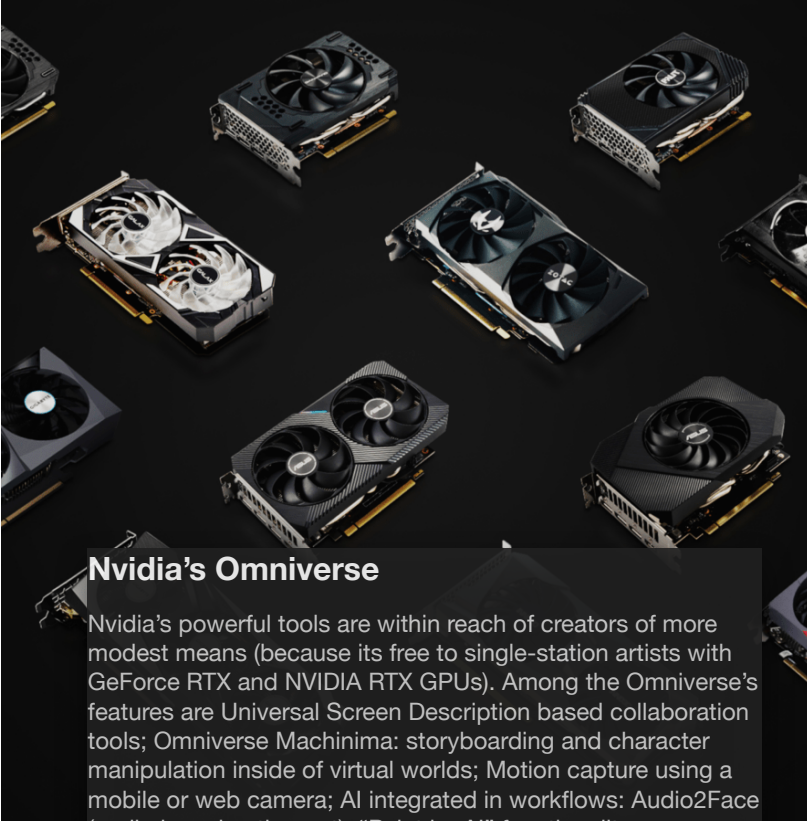
Photos: **Autel Robotics** (top left) showed its Dragonfish Series of vertical takeoff winged drones; **Skydio** (above) introduced the Skydio 2+ which features a KeyFrame mode for programming "impossible camera motion..."; **Visisonics** (lower right) has developed a 64-microphone array to capture audio and announced RealSpace 3D, a sound engine that allows 3D spatial audio to be personalized.



Fraunhofer MPEG-H Audio

Fraunhofer demonstrated a capability that consumers have craved for years, the ability to adjust the volume of dialog separately from music and background audio. The MPEG-H Audio technology will allow consumers to choose from presets or create their own settings for both broadcast and streaming audio. It is now possible, for example, to switch between different languages, adjust the volume of a sports commentator, enhance the dialogue, and choose from several audio description options. For more information on Fraunhofer, MPEG-H, and other workflows, [visit their website.](#)





Nvidia's Omniverse

Nvidia's powerful tools are within reach of creators of more modest means (because its free to single-station artists with GeForce RTX and NVIDIA RTX GPUs). Among the Omniverse's features are Universal Screen Description based collaboration tools; Omniverse Machinima: storyboarding and character manipulation inside of virtual worlds; Motion capture using a mobile or web camera; AI integrated in workflows: Audio2Face (audio in, animation out), "Paint by AI" functionality; MetaHuman character integration; GeForce Now in smart TVs from LG & Samsung announced at CES2022.

ENTERTAINMENT TECHNOLOGY CENTER / CES 2022 UPDATE

TRANSITIONAL CE (CON'T)

fertile area of tech harvesting. AI applied in physical solutions is poised to run ahead in areas we initially might have assumed would flow downstream from traditional sources.

Just a spattering of new products recently points to the outsized effect of machine learning with a consumer value proposition that will eventually be of great interest. Computational photography at its current level of accomplishment is magic in the consumer space. The **Cinematic mode** on the new iPhone 13 series, for example, points to what might be possible if we rethink these ideas as automated camera mount systems did just a decade ago.

For a creator or one-man band, these tools are getting close to a prosumer level solution that features a range of near professional capabilities of capture, cinematic art, instant production and delivery.

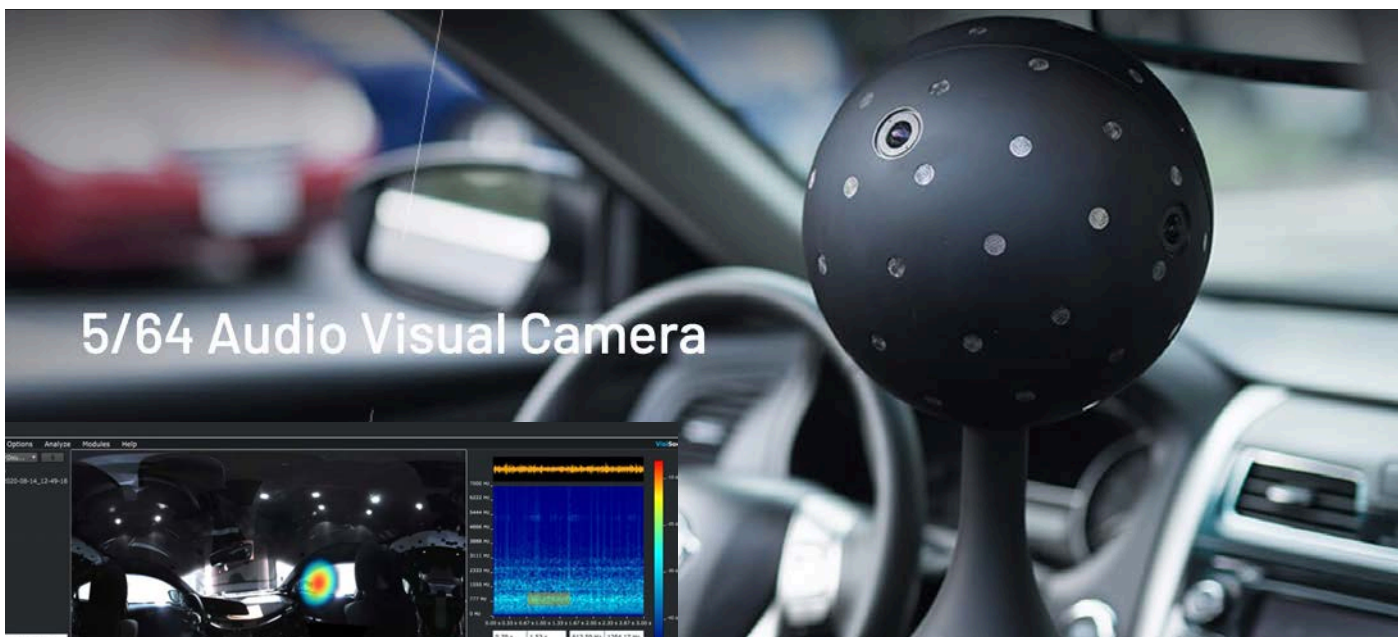
5G emerges as the "Edge of everything" solution for smart device delivery, writes ETC correspondent Paula Parisi. Quoting Qualcomm CMO Don McGuire, who did tours at Intel, NBC Universal, and Dell, said, 5G is "pervasive,,,this unifying connectivity fabric.

What we've seen over the past 12-24 months is this amazing technology curve market acceleration, that's just blown everybody's minds. What usually takes 7-10 years — both on the consumer side as well as on the enterprise side — has taken basically 18 months. A manifestation of that is this massive upgrade cycle...massive increase in demand in different device categories - Don McGuire, CMO, Qualcomm

Qualcomm Targets 5G, Auto, Edge Computing, AR, VR

During CES 2022, Qualcomm president and chief executive officer Cristiano Amon announced that the company intends to focus on the connected intelligent edge, which he says is a \$700 billion market. "We're becoming the partner of choice for the edge," he declared. "We continue to see momentum across key opportunities." The company's momentum encompasses next generation Arm PCs, virtual and augmented reality, including a continued partnership with Meta, wireless fiber and the automotive sector. The latter includes new deals inked with Volvo, Honda and the Renault Group. [Read More](#)





5/64 Audio Visual Camera



VisiSonics Showcases New 3D Spatial Audio Solutions

Acoustic visualization is quickly becoming the industry standard for Noise Source Identification. Akin to a heat-map, the Audio Visual Camera provides “hot spots” on a visual panorama to highlight the location and pressure level of sounds.

The 5/64 Audio Visual Camera, a spherical array for acoustic visualization, consists of 5 video cameras and 64 microphones mounted on the surface of an aluminum sphere. The 5 HD video cameras simultaneously generate an associated omni-directional panoramic video stream of the captured environment. [Read More](#)

ENTERTAINMENT TECHNOLOGY CENTER / CES 2022 UPDATE

TRANSITIONAL CE (CON'T)

Updated Drone Tech Offers Possibilities for Production

While drone announcements failed to generate the same buzz during CES 2022 as in previous years, several new products should be of interest to consumers and professionals, especially those in photography, video and movie production. In addition to demonstrations of hydrogen fuel cell tech promising increased flying time and new underwater micro-ROVs touting a range of enterprise applications, CES included affordable feature-rich drones such as Autel Robotics' Dragonfish with built-in 4K video and 50X optical zoom; Skydio's self-flying drone, geared toward cinematographers; and Sony's Airpeak S1, the smallest drone to support a full-size mirrorless Alpha camera.



Noveto 1 - Smart Beam Personal Audio

An Israeli company with offices in the Bay Area, Noveto has developed a new, AI-based technology called Smart Beaming. It works like two invisible speakers beaming sound right outside your ears. A 3D sensing module and camera tracks head movement that enables the sound pockets to move with the listener. You can watch a demo video above and visit their [website](#).





Hyundai Motor Company presented a compelling vision of the future that blends the metaverse, the Internet and robotics to make time, distance and the distinction between the physical and virtual worlds irrelevant. [Read More](#)

ENTERTAINMENT TECHNOLOGY CENTER / CES 2022 UPDATE

MULTIVERSE

The “M” word was everywhere.

It was definitely the “marketing-verse” at CES.

However, the hype cycle should not be confused with the generational momentum towards social entertainment experience in virtual spaces, like Fortnite, and is a true manifestation of the direction of the culture.

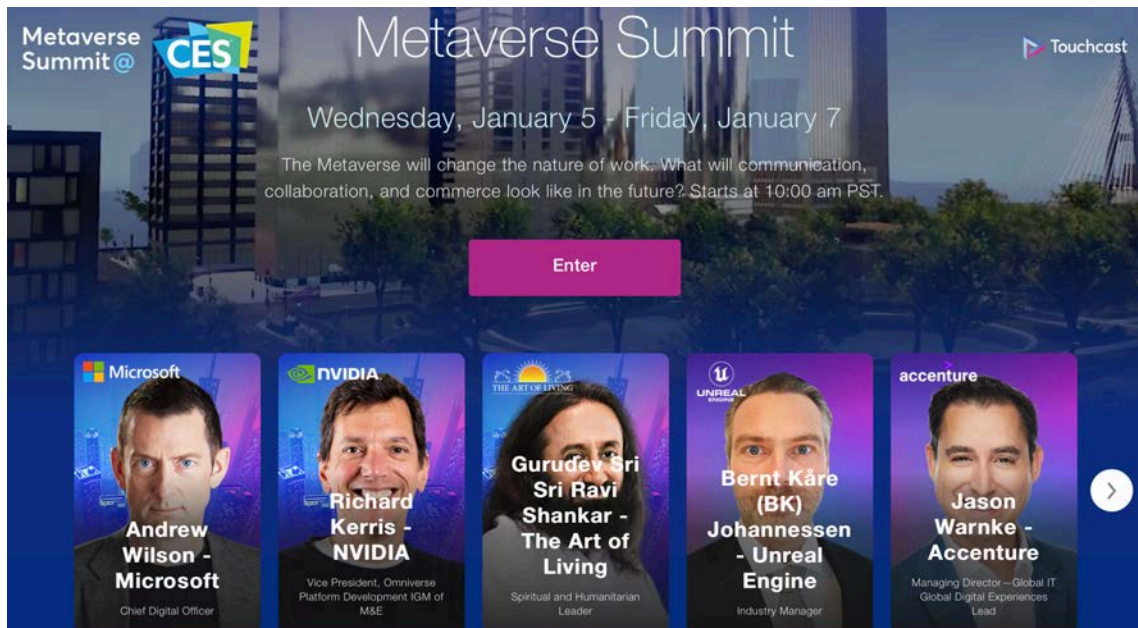
The company formerly known as Facebook fueled the hype with

their name change to Meta. But the framework for what ETC calls the Multiverse has been growing steadily for decades. While there is no single definition for the Multiverse, the confluence of many formerly disconnected aspects of media and entertainment combined with advancing technologies and a cultural shift from passive consumption of entertainment to active participation and immersion.

Six Keys for Content Creators

- **A persistent, real-time 3D medium for sharing experiences**
- **Openness is key**
- **Requires a strong social component popular**
- **Examples are already popular**
- **Structure will evolve from existing apps and technology**
- **Accessibility for all developers and creators is necessary**





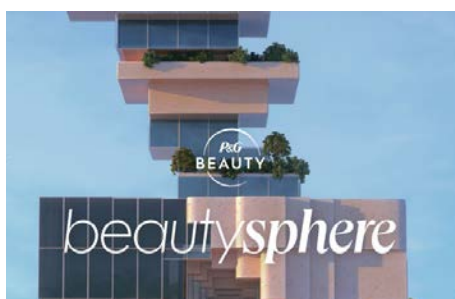
CES Metaverse Summit

Touchcast gathered executives and thought leaders to present three days of talks and discussions at virtual Metaverse Summit. How the metaverse, multiverse, or omniverse will change the way we work, play, socialize, and create was covered from many angles. The sessions are available on demand online.



Hyundai, Panasonic and LG Join Metaverse Rush

Exhibitors at the CES 2022 electronics show have been eager to jump on the metaverse bandwagon and Asian companies are no exception -- even if they are still figuring out what, exactly, the futuristic concept means. - [Read More at Nikkei](#)



P&G Takes First Step into the Metaverse with BeautySphere

P&G's BeautySphere is the CPG giant's first foray into the metaverse, where it joins other major marketers seeking to establish a foothold on a nascent virtual landscape that's seen increased interest from digital-first consumers who have adopted non-fungible tokens (NFTs) and related technologies. [Read More on Marketing Dive](#).



Wunderman Thompson Unveils Its Own Metaverse at CES

As more and more brands experiment with metaverse activations, Wunderman Thompson is launching a new virtual environment to give the agency's clients a sense of the capabilities this futuristic space has to offer. [Adweek](#) - [Read More](#)



T Glasses

Kura Gallium Glasses

ENTERTAINMENT TECHNOLOGY CENTER / CES 2022

THINGS TO WATCH

Augmented Reality (AR) is an access point to the multiverse. In enterprise applications where AR is used as an assistive technology in industry, for example, it has demonstrated its value. Three years ago, Verizon demonstrated how the combination of low latency 5G combined with AR glasses could be used to guide a surgeon during a delicate brain surgery. This year at CES we saw considerable progress, with the greatest strides in image detail, field of vision, and style. The latter is a key to broader adoption and greater utility, especially when we consider that almost 75% of the population wear some form of vision correction (glasses or contact lenses), according to The Vision Council.

Why 2022 is the year virtual and augmented reality will come to life

The virtual reality and augmented reality markets are expected to grow to nearly \$600 billion by 2025, according to industry research, and announcements of new products from big-name companies like Sony, Lenovo, HTC, Panasonic and others at the annual trade show in Las Vegas suggest robust consumer demand for reality-altering products, CBS News reports.

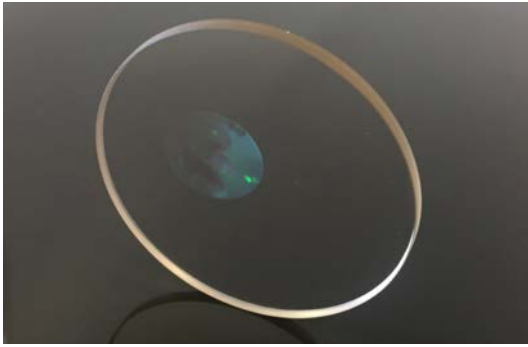
Kura Gallium

A CES Innovation Award winner, the Kura Gallium glasses are recognized as a standout performer. It has a 150° Field of View; Adjustable 8K/6K/4K resolution with foveated display and rendering and industry-leading 70 pixels/degree angular resolution for text readability. It boasts 95% transparent structured geometric waveguide eyepiece; High dynamic range, true black, 100% DCI-P3 coverage and up to 10-bit color via LED technology producing 4000-nit equivalent outdoors viewable image and unlimited depth of field (10 cm to infinity). Prescription compatible.

Fittingbox Demonstrates Unexpectedly Useful AR App

Sometimes you see a product idea that is so obvious you wonder why no one created it sooner. French company Fittingbox has developed an augmented reality app and a 3D model database that lets you try on new frames for eyewear without taking off your old glasses, so you can actually see what you look like as you try them on. Diminished reality is a subset of augmented reality focused on removing, rather than adding, elements of what you see and hear. The Fittingbox app uses the selfie camera on a smartphone to scan the face of the customer. It then recognizes and removes the wearer's glasses from the 3D modeled image. "Our mission has always been to develop more immersive solutions through technology," said Fittingbox CEO and co-founder Benjamin Hakoun. "We have generated more than 95 million virtual try-ons in 2021."





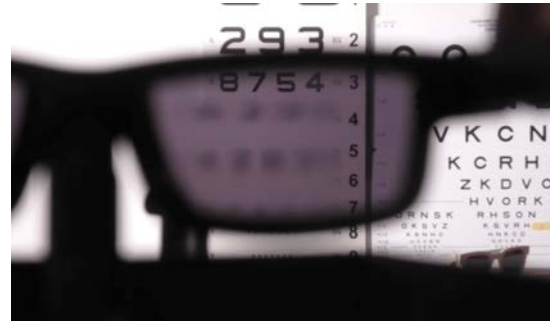
Meta Materials - Holographic Optics

MetaMaterials technology platform encompasses three core capabilities, holography, lithography, and wireless sensing using proprietary “MetaMaterials” that interact with light and energy in ways that go beyond nature. Demonstrations of holographic touch screens, 5G transmission, and an invisible layer that can be applied to eyeglass lenses to enable AR impressed.



Vuzix Smart Glasses

Stylish, prescription-ready safety glasses and 8-core CPU combine in the Vuzix Shield™. Connect to the metaverse accessing IT sensors, instructions, or live remote guidance. A partnership with Verizon focused on advancing technology and commercializing immersive augmented reality training experiences powered by Verizon’s 5G Ultra Wideband service and edge compute platform.



DeepOptics

DeepOptics proprietary technology dynamically corrects vision impairment using pixelated liquid crystal (LC) lenses. The lenses perform like the human eye, allowing the wearer to see what they want when they want. DeepOptics technology adds almost no extra weight or bulk to the design of natural looking glasses.



Panasonic Shiftfall VR

Shiftfall, a division of Panasonic, revealed a pair of compact goggles that use 120 Hz MicroOLED displays. The MeganeX headset weighs 8.8 ounces, and has a resolution of 2,560x2,560 pixels per eye. It runs on a Qualcomm Snapdragon X1 process and utilizes the compact pancake lens configuration. The headset is expected to retail for about \$900 starting this Spring.



Breylon offers “A window to a whole new world.”

MIT Media Lab spin-off Breylon, founded in 2018, demonstrated its Ultra Reality screen technology. The display tech uses computational optics to essentially offer a curved 120-inch 3D “theater-like experience” via a 32-inch desktop monitor, which the company suggests is ideal for entertainment, gaming and enterprise applications “beyond screens, into the metaverse.” The concept relies on realistic depth effects and image composition techniques to provide users with a plug-and-play, high-fidelity, virtual experience that does not rely on VR headsets.





ENTERTAINMENT TECHNOLOGY CENTER / CES 2022

THINGS TO WATCH

There is a power shift in the automotive segment, underscored by Sony's CES 2022 announcement of a new operating unit, Sony Mobility. Whether they will, in fact, become a car company remains to be seen but their concept cars suggest there is a new player, either as an innovator or a competitor.

The rise of electric vehicles is enabling this shift, due in large part because it is simpler to plug in an electric engine than it is to

build internal combustion. It is now internal systems — the sensors, computers, batteries, electronics, and connectivity — that define cars, not horsepower.

The new West Hall of the Las Vegas Convention Center housed several new players in the automotive space, including VinFast, debuting from Vietnam. CNET called CES 2022 “The best automobile show in years.”

Established car companies are not to be overlooked. For decades their designers have been futurists. That tradition continues with GM's Inner Space concept car pictures on the next page and on video.



BMW Changes Colors

Car brand BMW has unveiled an updated version of its electric iX SUV at the Consumer Electronics Show that can change colour from black to white in order to suit the driver's mood and conserve electricity,” quoting design publication Dezeen.

Dubbed iX Flow, the concept car is wrapped in a kind of “digital paper” that is also used to form the screen of the Kindle e-reader.





“Electrification and autonomous driving will fundamentally change the role of vehicles and the experiences customers have with them,” Bryan Nesbitt, GM executive director, Global Advanced Design and Global Architecture Studio. “We’re exploring where that will go with these innovative concepts, envisioning mobility as an ally of wellness, giving customers the ultimate luxury, more personal time rather than taking it.”

GM Chief Details Ambitious EV and Autonomous Plans [Read more](#) on ETCentric





Top left: Labrador Systems Retriever Robot. Bottom left: Waymo Via is expanding its existing partnership with logistics company J.B. Hunt Transport Services from a pilot into a long-term strategic alliance, [TechCrunch reports](#). Above: Nvidia's Omniverse

EYEBROW / CAPLINE HEADER

ARTIFICIAL INTELLIGENCE

Platform consolidation, no-code programming, autonomy coming of age, actually useful robots, are areas of applied AI that Yves Bergquist, director of AI and neuroscience in media for ETC found of greatest interest at CES.

Of particular interest to him was: NVIDIA's Omniverse updates (now free, 3D marketplaces, integration with Epic's MetaHuman) are very impressive. To me it means that they're becoming the central platform (operating system) for 3D.

Avalanche's no-code AI tool (hAlsten) impressed. It is generally no-code AI and ML that is very

disruptive because it allows virtually anybody to create AI applications.

AI ethics was big also, with INFINIQ's data anonymization service ("Wellid") being a leader at CES 2022. The company has Rolled out software that analyses visual data (faces and license plates) in a way that is anonymize don the backend.

Autonomous driving and flying (Skydio 2+) is finally ready to be productized and exist in our lives.

Dallara AV-21 autonomous racer was very cool. It competed ion the Indy Car Autonomous Challenge race at CES. Interesting to see the emergence of "operating systems" like Apex.ai or NVIDIA's Hyperion 8 for autonomous driving. C

Autonomous driving is maturing to the point where actual services are growing. GM's Cruise is deploying robot taxis (Robotaxis) in San Francisco. Waymos is expanding their deal from pilot to a real program with JB Hunt for self-driving trucks and they have another deal Geely to roll out a fleet of self-driving taxis in China. John Deere has invested heavily in AI for he past 20 years and announced their first fully autonomous driving for its tractors.

Cool and useful robots also impressed. Labrador Systems Retriever Robot was shown in commercial settings and homes, where individuals with mobility challenges can be assisted. Ottonomy's food and delivery robots already operates in airports and other public places.





Avalanche Computing

Avalanche computing offers a low-cost, no-code AI and ML (Machine Learning) tool that allows virtually anyone to create AI applications. Watch the video above.



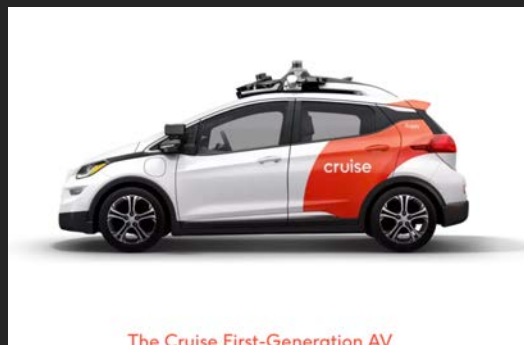
Infiniq

AI ethics was a big topic at CES and INFINIQ's data anonymization service ("Wellid") impressed as being a leader.



Dallara AV-21

Dallara AV-21 autonomous racer was very cool. Interesting to see the emergence of "operating systems" like Apex.ai or NVIDIA's Hyperion 8 for autonomous driving.



The Cruise First-Generation AV

Cruise - Robotaxis

A waitlist [website](#) has opened for Cruise, GM's venture robotaxi service in San Francisco. The autonomous livery is custom-built in the foundation of the Chevy Bolt.



Ottonomy

Ottonomy delivery robots are already in use in airports and other places delivering food & beverages, groceries, and packages to curbside, last mile, and even indoor environments.

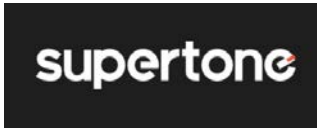


John Deere

Until recently, agriculture had always been about doing more with more, CTO Jahmy Hindman noted, more horsepower, more inputs and more acres. Driverless tractors can help farmers overcome that obstacle and more with their precision technology, making it possible to take on one of the world's biggest challenges—feeding our growing population.

The world's first voice synthesis solution for singing and acting.

We create a hyper-realistic and expressive voice that cannot be distinguishable from real humans.



Supertone

Supertone captures the tone and inflection of original speakers and singers and enables that intonation to transform an ordinary speaker to sound like the original. Can be very useful in dubbing, ADR, and other VoiceOver work.



LG Transparent Display

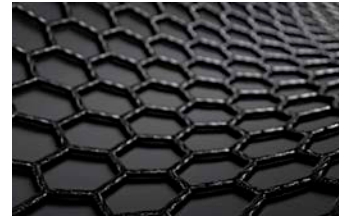
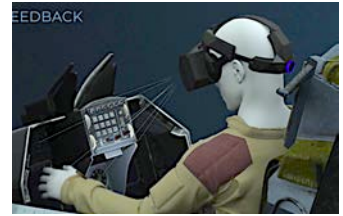
Several companies, including LG, showed transparent video screens that open new opportunities for digital signage.



VideowindoW

VideowindoW is the only transparent display solution that functions as glare control and climate control. This makes it the ideal solution for airports and other buildings with large glass surfaces. VideowindoW adjusts the transparency of glass in a way that turns it into a screen. The content on this screen then doubles as glare control.

THINGS TO WATCH



Above clockwise from top left: HOLO TOUCH, contactless and germ free from Holo Industries; EXTAL 3 mixed reality headset for pilot training; NANOTECH Energy's non-flammable graphene battery; BIOFUEL paper bio-fuel batteries from BeFC.



Audio Design Desk

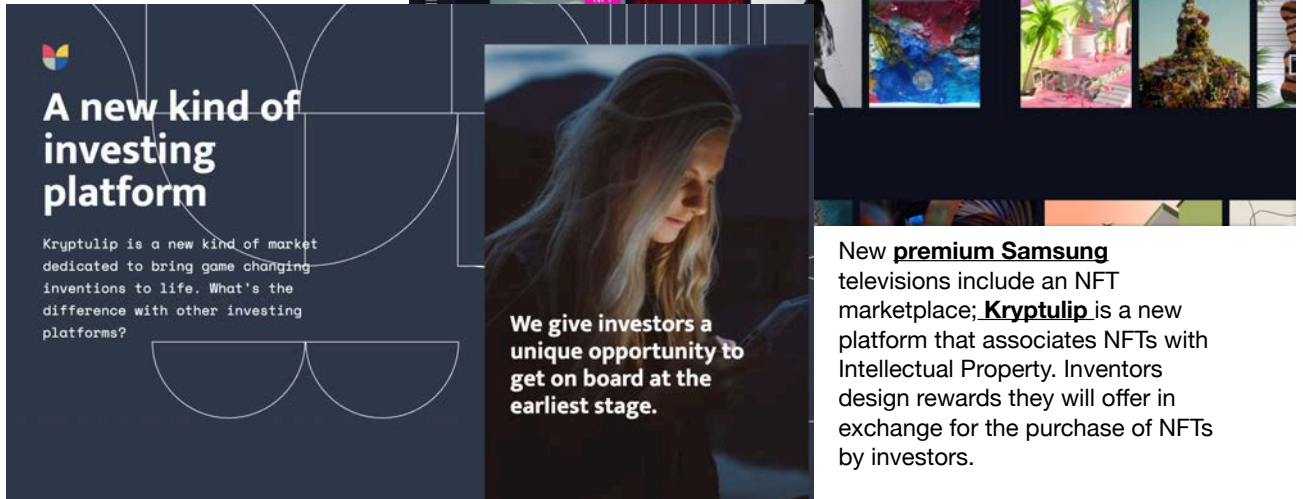
Audio Design Desk streamlines sound placement and replacement for movies, television, music, and games. Mix magazine called it a groundbreaking application that significantly speeds up the act of accurately adding sound effects and music to picture."



OWO Tactile Vest

OWO has developed and patented a haptic system that allows users to feel physical sensations on 10 different areas of your upper body. Sensations include insect bite, punch, shot with exit wound, dagger, ball, and others. The vest works with a growing list of games that include Fortnite and League of Legends.





NFT, CRYPTO, AND BLOCKCHAIN

CES held its first-ever panel discussion on NFTs – non-fungible tokens for the uninitiated – with two experts who have grown up with the nascent industry sector. United Talent Agency head of digital assets Lesley Silverman noted that her company established the new division in March 2021. Her guest was Art Blocks founder and CEO Erick Calderon, who first got involved with NFTs in 2017 by following a thread on Reddit. Both had advice for newbies: Don't let the jargon

intimidate you and store your seed phrase in a cold storage device.

Silverman and Calderon alternatively defined some of that jargon and delved into the deeper mysteries of Web 3.0, smart contracts, blockchain and secondary markets. First, NFTs: Calderon notes that a dollar bill is “fungible” because they are all interchangeable. NFT’s are “non-fungible” in that each one is unique. “NFTs are guaranteed to be 100 percent unique in a way that is provable via blockchain,” he explained.

His first experience in NFTs was when Larva Labs, on a Reddit thread, encouraged people to claim assets from their new project CryptoPunks. Calderon realized

that, rather than a private project, the fact that CryptoPunks was launched on blockchain meant that those who claimed assets would have a vested interest in them. He claimed a few of the 88 Zombies for a \$35 transaction fee, but didn’t realize that, within short order, these assets would be worth real money. He began selling the Zombies for \$200; one just sold for \$5 million.

But he was hooked and created **Art Blocks** to use his coding skills to create what is called generative art, which describes “art created over time with use of an autonomous system.” For Art Blocks, Calderon created a new generative art minting system whereby the artist and buyer accept whatever is randomly generated from the algorithm, as opposed to the artist



endlessly iterating. Art Blocks is now a corporation with a full-time staff and millions in transactions.

Silverman brought up the fact that NFTs exist within a Web 3.0 environment. “There are many definitions of Web 3.0,” said Calderon. “But for me it didn’t happen until I logged into a website with authenticated credentials of a blockchain address. Your ownership isn’t based on a username or password but cryptographic proof of who you are.” Silverman noted that, whereas a year ago, creating a MetaMask crypto wallet and gateway to blockchain apps was complicated, it’s gotten a lot easier.

“The moment you register that seed phrase, you enter a new phase of your life, and you have to treat it like the valuable asset you have,” warned Calderon. “And be careful with your private keys. This is still the Wild West.”

For Silverman, coming from the contemporary art world, her first draw to NFTs was the understanding that smart contracts guaranteed artists’ participation in an on-going revenue stream. “I consider that revolutionary and I knew it would upend the art world,” she said.

Calderon noted that, because a smart contract is operated by computer, “it’s also the most ruthless contract in the world.” He pointed out that it’s the secondary market for NFTs that allow artists to participate in their own success. “OpenSea is the largest market for the secondary market, with creator royalties built into their contracts,” he said. “We hope that as other marketplaces pop up, they also respect that.”

A CES 2022 session on “Decoding Crypto,” moderated by Transform Group founder and chief executive officer Michael Terpin, touched on the growth and evolution of cryptocurrency as well as regulatory issues and recent developments.

Terpin enthused over the sector’s dramatic growth, while panelists Blockchain Association founding executive director Kristin Smith, Celsius Network chief growth and product officer Tushar Nadkarni and Filecoin Foundation founding director Clara Tsao had their own yardsticks to analyze crypto’s evolution. For Smith, it’s the growth of the Blockchain Association from 10 relatively small companies three-and-a-half years ago to 70 companies — among them 15 unicorns — today. “But a more important proxy for growth is the interest we are getting from members of Congress,” she said. Whereas it used to be hard to get anyone on Capitol Hill to listen, now, she said, lawmakers’ interest is keen.

At Celsius, which describes itself as “a platform of curated services that have been abandoned by big banks — things like fair interest, zero fees and lightning quick transactions,” Nadkarni explained that users earn interest on their cryptocurrency and can also take out very low-cost loans. “We are at 1.5 million users of the platform,” he said.

Tsao’s Filecoin Foundation aims to build an open source, decentralized storage network “designed to preserve humanity’s most important information.” “We create programmable money that is more decentralized,” she said, referring to Decentralized Finance (DeFi), which has overtaken Centralized Finance (CeFi) introduced in 2017.

She noted that storage is currently controlled by a small number of very big companies. “We are working on adoption in the NFT space,” she said, “And we have over 15 million NFTs in our storage space.” The global community of Filecoin storage providers has dedicated over 10 exibytes (EiB) of decentralized storage capacity — the equivalent of 2.5 billion gigabytes.

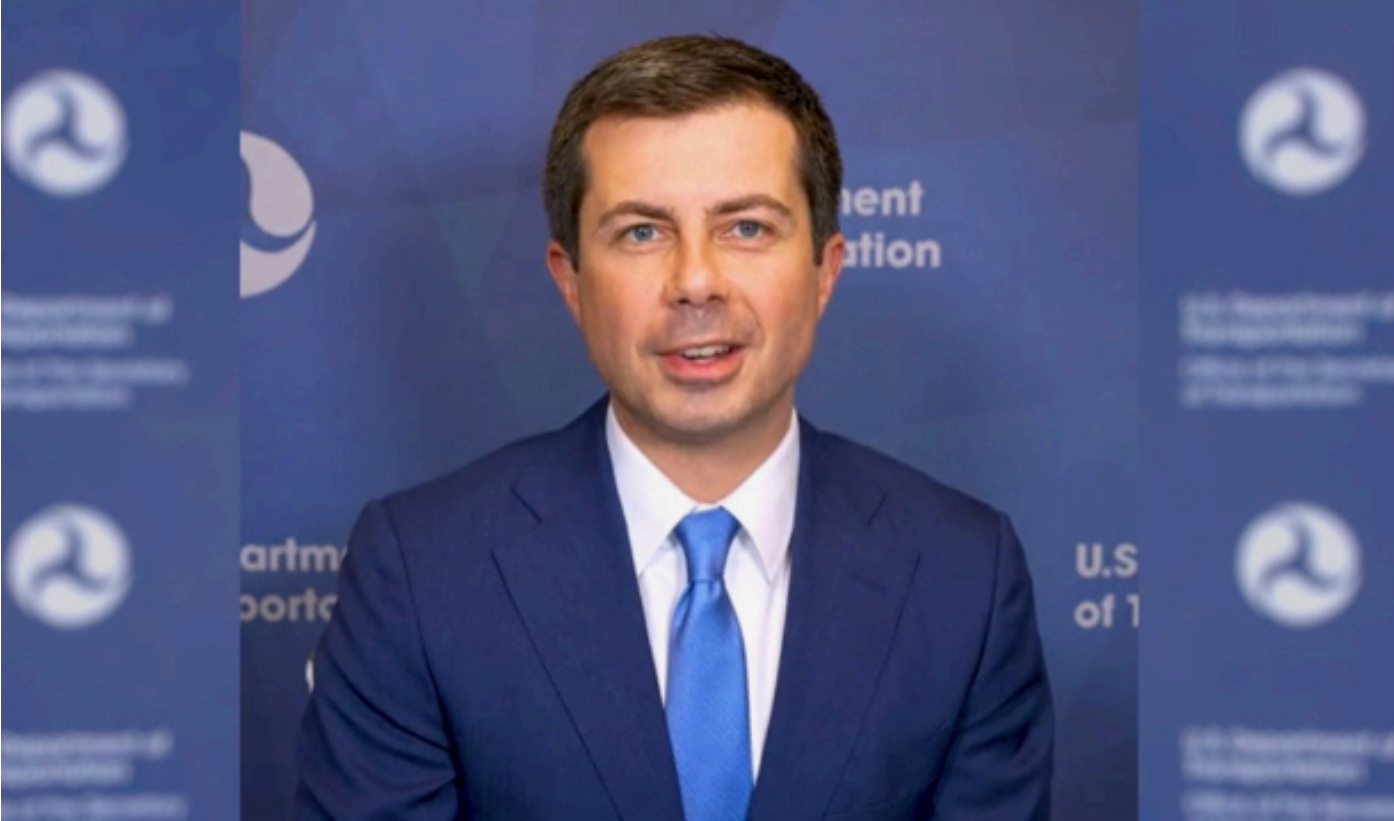
Traditional financial institutions are split in how they are responding to cryptocurrency, said Nadkarni. “Some understand the trend that’s coming and are evolving their businesses,” he said. “Others are actively trying to create friction.”

Smith stated that, “the financial services industry now revolves around an intermediary that can be regulated.” “The act of decentralized exchange in the securities world is very regulated,” she said. “What regulators have a hard time understanding is if they have customers or customer information.” The challenge, now, she said, is that the risks in DeFi are different.

“It requires fresh thinking and developments in identity on blockchain that allow for appropriate info to be shared that doesn’t reveal everything,” she noted. “But there is a lot of innovation around that space that will eventually settle out.”

Tsao said she is seeing many chief executive officers moving into the metaverse. “A lot of people today are using NFTs in the gaming space and creating virtual worlds,” she explained. “We’re just seeing this space explode. Web 3.0 promises to share the wealth with a much broader group.” “There are so many hard questions going forward,” she added. “It’s a perfect time to become an expert. Everyone is learning every day. There are no dumb questions.”





U.S. Secretary of Transportation Pete Buttigieg said the U.S. “must reinvent the machinery of government itself, just as much as any piece of transportation equipment,” in his CES speech on the future of transportation. [Read More](#)

POLICY AND REGULATION

Privacy and cybersecurity along with cryptocurrency were the subject of elected officials and corporate executives. ETC covered many of the panels sessions.

CES: Government, Tech Firms Partner to Curtail Cyberattacks

During a panel at CES 2022, CTA specialist in government affairs Quentin Scholtz queried panelists from government and technology on their priorities and plans for stepping up effective enforcement against cyberattacks, especially those originating from nation states. Jamie Susskind, tech policy

advisor for Senator Marsha Blackburn (R-Tennessee); former U.S. representative Will Hurd (R-Texas); and Samsung Electronics senior manager and counsel of public policy Eric Tamarkin offered complementary priorities on how to act in 2022 and going forward.

For Senator Blackburn, said Susskind, a strong privacy framework has been her No. 1 priority, but she also recommended that the Department of Defense consider a report from the National Security Council about AI. Blackburn, who serves on the Senate Commerce, Science and Transportation Committee, is also delving into protecting critical infrastructure. With Oak Ridge

National Laboratory located in Tennessee, Blackburn believes that setting up a cyber consortium for national labs is important to securing the energy grids and other facilities.

Ransomware is also a big topic for her, said Susskind, who noted Blackburn, along with other senators, launched a bipartisan Financial Innovation Caucus to ensure U.S. competitiveness regarding blockchain, digital assets and AI/ML among technologies. “She has also been very outspoken about China and other adversarial nations with regard to these technologies,” Susskind added.



POLICY AND REGULATION

Congressman Hurd said that “the issue of cybersecurity is the easier issue.” “Our global leadership is eroding away,” he said. “China is no longer a near-peer, it’s a peer. We need our immigration to attract the kind of technology talent we need. If China wants to steal our technology, let’s steal their engineers. We don’t have the workforce necessary to take on some of the existing challenges.”

He also emphasized that a national privacy standard is an absolute requirement and that the U.S. should use the EU’s GDPR as a model. “We have another fight coming down the pike — AI policy,” he said. “They will pass legislation in Europe on this issue, and we should engage them on the new Cold War with the Chinese.”

Tamarkin pointed out that, as a semiconductor and electronics company, Samsung is deeply concerned about security. “Cybersecurity is an ecosystem problem,” he said. “All the players have a role, and the burdens aren’t necessarily all on the device level.” Susskind agreed, noting that the Cyberspace Solarium Commission, a bipartisan intergovernmental body that issued a report in March 2020 on developing strategies against cyberattacks, “did a good job of educating Congress.”

“The move to 5G makes the attack surface bigger and more diffuse,” she added. “Winning the race to 5G was originally a policy issue, but when we delved deeper, we started hearing

about the security risks of equipment and networks.”

Hurd noted that it took two years to pass the IoT Cybersecurity Improvement Act of 2020 that he introduced. “We need to create quantum resilience,” he added. “Remember Y2K? We spent \$1 trillion to prepare for that. We have to be prepared for nation states to attack.” For him, the attack of the Florida water system with the intent to kill or harm the population was the most chilling attack. “We need to leverage the understanding of the private sector,” he added.

Tamarkin noted that Samsung has a bug bounty program that pays security researchers who find a bug and alert the company. “We’re constantly getting information from partners in government,” he said. “Cybersecurity is not static.”

Susskind advised, “know your software — and know what inputs are fueling the product.” “Cybersecurity labeling is going to be more important going forward,” she said.

Hurd noted that, despite polarized politics of recent years, there is bipartisan acknowledgement of the threat of China. “I want this century to stay the American century,” he said. “But that will only happen if America and our allies show global leadership in the way we have since WWII.”

CTA senior vice president of political and industry affairs Tiffany Moore introduced Senator Jacky Rosen (D-Nevada) who convinced a bipartisan group of women senators to, for the first time, discuss technology at CES. Rosen brought senators Marsha Blackburn (R-Tennessee), Shelley Capito (R-West Virginia), Maria Cantwell (D-Washington) and Susan Collins (R-Maine), who all share a strong background and/or interest in technology issues. Rosen and Capito launched the first Women in STEM Caucus to advance women’s participation in these areas.

Rosen noted bipartisan support was key to passing the U.S. Innovation and Competition Act (USICA) in the Senate last year. She asked Cantwell, chair of the Senate Committee on Commerce, Science and Transportation, what her legislative priorities are for 2022. “The U.S. only represents 12 percent of semiconductor manufacturers globally, from 37 percent in 1990,” she said. “We need to return it to the U.S.”

She noted that the Senate’s USICA and its House equivalent were conferenced in December 2021, and



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she will still work to pass the Senate's bill.

Collins, who said her state ranks No. 50 in accessibility to high-speed Internet, wants to prioritize unserved and underserved households in considering the \$65 billion allotted to broadband in the U.S. "The pandemic was a lesson of the disparities of access to broadband," she said.

She noted that the University of Maine has opened an Advanced Structures and Composites Center, an interdisciplinary center for R&D on material sciences, manufacturing and engineering of composites and structures. The lab recently 3D-printed a 25-foot, 5,000-pound patrol boat in 72 hours.

For Blackburn, a key issue is "making certain we create the right environment for innovation." She pointed to the passage of the Ray Baum's Act to improve 911 calls carried through IP networks, as well as legislation for 5G, 21st century farming and telehealth. "Tennessee is a logistics state so autonomous vehicles are also important for us," she said, adding that she is interesting in working with Cantwell on a federal online privacy standard. "There's a lot of bipartisan agreement on this."

Capito added her voice to Collins' in a plea to bring broadband first to unserved and underserved households. "I'm from a mountain state and we still lag as does Maine, which disadvantages our students and healthcare system," she said,

adding that she wants to pass the infrastructure package. She's also interested in transitioning the workforce to STEM careers.

"The average salary of a tech person is \$75,000 and the average salary in my state is \$45,000," she said. "And women and minorities are also very underrepresented in STEM careers."

Cantwell noted that USICA will set up regional tech hubs to incubate talent and create a more diverse workforce. "I represent a high-tech state but we want to see innovation happen in other places," she said.

Rosen asked what other senators hope to see in their states as a result of USICA. For Collins, it's an expansion of high-speed Internet. "It's a game-changer, especially for rural America," she said. Capito added that, in addition to access to broadband, affordability is also an issue. "The Commerce Committee can provide great oversight," she said.

Bipartisan legislation in tech, said Blackburn, includes the children's online privacy legislation. "But you cannot have access to 21st Century safe communities without high-speed Internet."

Congresswoman Nanette Diaz Barragán (D-California), who serves on the House Committee on Homeland Security and the House Committee on Energy and Commerce, is concerned about the potential harm of cyberattacks in her 44th district, which includes of the Port of Los Angeles. Congressman Jay Obernolte (R-California), among his other assignments, is a member of the Committee of Science, Space and Technology and two caucuses, one on 5G and another on AI. What they both have in common are concerns about cybersecurity, topics that were addressed during a panel at CES 2022.

"Cyberattacks are not a new threat but they are more sophisticated and aggressive," said Barragán, noting the multiple harms that would ensue if the Port of Los Angeles were to be attacked. "That would be catastrophic," she said. "But cybercriminals — and more of them are state actors — are attempting to exploit our vulnerabilities." She believes that "government has a key role to play as a public/private effort to combat it."



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Barragán said that “this past year makes clear that we cannot take the security of our devices for granted and we must rigorously vet it.” “We must do what we can to reduce the attack surface with more secure products,” she said. She called the Biden administration “an ally” in this effort. “He’s appointed people to engage with private sector and coordinate with allies,” she said. “Following SolarWinds, he signed an executive order for the government to secure its own network.”

She listed more positive signs. “Private partners are motivated, and marketplace is incentivized to deliver more products,” she stated. “National Defense Authorization Act for 2022 was just passed.” That, she pointed out, would mean more resources for the Cybersecurity & Infrastructure Security Agency (CISA), which authorizes programs to detect and disrupt invasive operations.

“Much more work needs to be done,” she noted. “But it’s a bipartisan effort to attack these issues. Building resilience to cyberattacks must be a private-public partnership and a whole nation effort.”

Obernolte, who has a background in coding video games and a graduate degree in AI, noted the year’s “extraordinary developments regarding cybersecurity.”

“The Colonial Pipeline hack catalyzed a sea change in how we think government relates to the cybersecurity of our supply chain,” he said. “One cyberattack on one company shut down the industry for one week, and this was a private company.” That was followed by the

attack on JBS, the world’s largest meat processor.

Obernolte said the idea has reemerged that the federal government needs to play a role in protecting “key private infrastructure.” “Many private sector companies are unaware of vulnerabilities in their software.” He wants the government to “take a more active role in raising awareness of open source software.”

He’s also concerned about the eroding number of highly educated STEM professionals in the U.S. “China has surpassed us in the number of PhD’s in computer science it awarded,” he said. “We need to reverse that trend now. We need to get more young people engaged in computer science and empower the National Science Foundation with funding for research. These things will keep us on the vanguard of technology and catalyze our economy in ways we can’t even fathom right now.”

CES 2022 featured a compelling session that focused on “Artificial Intelligence: Expectations, Rules and Achievement,” which began with introductory remarks by Congresswoman Mariannette Miller-Meeks (R-Iowa) who questioned whether the federal government had AI experts who understood the innovations. “These are disruptive technologies,” she said. “What will it do to our healthcare system? With autonomous vehicles, do we have the relevant policies in place for government and insurance companies?” She also worried about competition in the space. This jump-started a panel discussion on the numerous opinions involving AI.

“How can we as policymakers allow the type of competition that we need to encourage entrepreneurship, innovation and growth without the outcome being swallowed up by larger companies where innovation may be suppressed?” she asked. “What’s the right amount of regulation and how do we fund it? Panelist Peter Brown, senior adviser on technology policy at the European Parliament Liaison Office in Washington, D.C., noted that “the biggest thing that standards bring to the table is



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certainty and predictability.” He gave the example that the term “autonomous” has a strict and exacting definition in Germany that is quite different from other regions.

“Having clarity on basic concepts and terms that develops through the standards-making process allows industry, legislators, regulators, public interest groups and other concerned parties to work together more productively,” he said.

At SeedAI, a nonprofit for community-driven AI policy, founder and president Austin Carson revealed that his organization commissioned Morning Consult to conduct a study of public sentiments around AI. He shared the results, which he found surprising.

First, Americans’ No. 1 concern is AI’s hackability, not a loss of autonomy. Across the ideological spectrum, 59 percent of liberals, 51 percent of moderates and 49 percent of conservatives were more likely to approve of their Congressperson if he/she was committed to investing in AI job training in their community — and 22 percent of Republicans said the same thing about President Biden.

The report also stated that about 75 percent of Millennials, 75 percent of GenXers and 61 percent of Boomers would want to learn about AI if there were job opportunities in their local community. Also, “nearly half of adults said that if the U.S. were to invest in developing AI technology, training workers for AI jobs, or educating students on how to use the technology they would be less worried about the hackability, loss of agency, and other concerns.”

Last, about two-thirds of adults believe that private companies as well as state and federal governments should work to ensure that AI is safe and trustworthy.

Accenture spokesperson Dr. Teresa Tang said that, for the private sector, AI is “just another product — similar to making software.” To make it work at scale, we need deadlock testing of AI, from proofs of concept all the way to production, she said. “You can watch if your model is drifting and un-deploy models that aren’t working.”

Brown is working on the EU’s pending AI Act. He reports that, after widespread consultation, the draft appeared in April — but it still has a long path to go from its proposal status to a law. “Parliament is very conscious that AI legislation is as big as GDPR in terms of scope,” he said. “There is a high degree of anxiety and the breadth of opinions is overwhelming.”

Currently, Brown reported they are studying “the hierarchy of technologies that ought to be banned from use, those that need to be regulated and others that are less risky and businesses can be trusted to follow certain principles.” But, he said, there is no consensus yet. As to whether the EU hopes its AI Act will be a model for the U.S., similar to the GDPR, Brown said, “if you want to rein in the bad guys, be careful what you are aiming for.”

“Those with the economies of scale will be the first to market,” he said. “With GDPR, it was the smaller businesses that got hit the worst because they didn’t have the resources.”



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Throughout CES, editor Rob Scott, Paula Parisi, Deborah Kaufman, and Phil Lelyveld attended virtual press conferences and monitored conference sessions to bring ETCentric readers news with a sharper focus on topics of importance to ETC member companies. Stories that have not already appeared elsewhere in this report are presented to you here.

8K Association Promotes the High-Res Ecosystem

The 8K Association was founded about three years ago to draw attention to the nascent 8K value chain and now, says executive director Chris Chinnock, that entire ecosystem, from production and post to live-to-air events, has become a reality. TV brands, panel makers and chip set providers are the 8K Association members that will primarily be at CES 2022 in January. The Association will not have a booth at the confab, but Chinnock will be making the rounds to tout some of the highlights of 8K's progression over the last few years. Japan has been broadcasting 8K since December 2018, for example, and the Summer Olympics in 8K were "a big hit." [Continue reading CES 2022: 8K Association Promotes the High-Res Ecosystem](#)

Top Concepts from the 2022 Eureka Park Startup Zone

ETC's George Gerba and Don Levy spent Wednesday perusing the CES 2022 Eureka Park startup zone looking for new companies and unique products that would be of particular interest to the entertainment industry. Among this year's most compelling concepts were an AI-assisted content creation tool, COVID-compliant tech ideal for workspaces and productions, AI-based audio tech, a response tracking system for dynamic displays, emerging NFT approaches for artists, new tech investing models, light-based networking solutions, paper-based biofuel cells and haptic wearables. [Continue reading CES: Top Concepts from the 2022 Eureka Park Startup Zone](#)

Highlights from the 2022 CES Unveiled Pre-Show Event

ETC's George Gerba visited the CES Unveiled show floor in Las Vegas Monday evening looking for companies and products that would be of interest to our members, illustrate emerging trends, or are simply unusual. Gerba discovered a range of compelling technologies across areas such as blockchain, non-fungible tokens, Li-Fi, wearables, large-scale video screens, the metaverse, remote work, cell signal

boosters, health, batteries and more. Among the more interesting companies at CES Unveiled this year were Icecap, Oledcomm, Somalytics, VideowindW, Toraru, SureCall, Biospectral, Prinker, Airxom and Nanotech Energy. [Continue reading CES: Highlights from the 2022 CES Unveiled Pre-Show Event](#)

New Ultra Portable Projectors Stand Out at Trade Show

Several ultra portable projectors were on display at CES 2022. Among the more interesting short throw models were products from Anker, Hisense, Samsung and XGIMI, although the show also featured a range of projector types from the likes of BenQ, JVC, Panasonic, Vankyo and ViewSonic. Generating the most buzz in the short throw category was Samsung's \$899 projector, The Freestyle, that can project from 30 to 100 inches and comes equipped with a 1080p HDR-capable view and 360-degree audio. Also drawing media attention was Anker's upcoming Nebula Cosmos Laser, which comes in 4K (\$2,199) and 1080p (\$1,599) versions, and is expected to ship by late March. [Continue reading CES: New Ultra Portable Projectors Stand Out at Trade Show](#)

Samsung Targets Gamers with Monitors and Smart TVs

Samsung is sharing more specifics about its Gaming Hub and HDR10+ Gaming standard, unveiled at CES 2022. Samsung's high-end 2022 TVs, including the Neo QLED line-up (Q70 and above) and gaming monitors will support what Samsung Electronics Visual Display Business executive vice president and head of R&D Seokwoo Yong calls "a game-changing experience," with richer, life-like images, variable refresh rates (VRR) of up to 120Hz, automatic HDR color correction on a game-by-game basis, as well as an in-menu streaming hub with access to the Nvidia GeForce, Google Stadia and Utomik cloud libraries. [Continue reading CES: Samsung Targets Gamers with Monitors and Smart TVs](#)



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Support for Matter Helps Drive Smart Home Momentum

Matter was a big player at CES 2022. Built around the premise that smart homes need a single, unifying interface standard that makes devices “secure, reliable and seamless to use,” the Matter alliance now has more than 220 member companies, including Apple, Comcast, LG and Samsung. Amazon announced developers can add Frustration-Free Setup on Matter-certified devices using the Matter SDK, and Google declared its Fast Pair simple setup is supporting Matter. As companies build new smart products, Matter believes that users should merely plug them in to make them operational on the home network.

[Continue reading CES: Support for Matter Helps Drive Smart Home Momentum](#)

CES: Canon Solutions for New Reality of Virtual Work and Life

Canon introduced two new software-based collaborative tools it has in development: AMLOS, a video meeting platform based on gestures, and the VR platform Kokomo, a social VR platform for immersive video calls. Under the theme “Together Next,” Canon enlisted actor Joseph Gordon-Levitt and his online collaborative media platform HitRecord to demonstrate using the new hybrid collaboration technology in a virtual, real-time writers’ room. In addition to operation through gesture control and connectivity with Microsoft Teams and other collaboration apps, AMLOS will allow a single camera to capture multiple angles when it debuts later this year. [Continue reading CES: Canon Solutions for New Reality of Virtual Work and Life](#)

Nuvvyo Showcases Its New Tablo ATSC 3.0 Quad DVR

Canadian electronics and app firm Nuvvyo has introduced an ATSC 3.0-compatible over-the-air DVR that also receives existing OTA signals. The Tablo ATSC 3.0 Quad HDMI hybrid DVR records up to four channels simultaneously and accepts external hard drives of up to 8TB. The Tablo connects to any TV antenna and television, monitor or modem with an HDMI port. However, unlike other Nuvvyo network DVRs this Tablo model does not support the live streaming or sharing to

other displays of recorded OTA content. Nuvvyo says for optimum performance the Tablo ATSC 3.0 Quad should be connected to a 4K HDR television. [Continue reading CES: Nuvvyo Showcases Its New Tablo ATSC 3.0 Quad DVR](#)

Spotify Call-to-Action Cards Make Audio Ads Clickable

Spotify is bringing interactivity to the audio ad experience for podcasts with “Call-to-Action Cards.” As part of Spotify’s streaming ad-insertion platform, the CTA cards will appear in the app as soon as a podcast ad begins playing, resurfacing when a listener is exploring the app, reminding them to check out the product or service and eliminating the need to remember a promo code or URL. Advertisers can customize the CTA cards with images, text and clickable buttons. The feature makes podcast ads visually interactive for the first time, transforming the experience into something listeners can see, “and, most importantly, click.” [Continue reading CES: Spotify Call-to-Action Cards Make Audio Ads Clickable](#)

Panel Reveals Surprising Statistics on Perceptions of AI

CES 2022 featured a compelling session that focused on “Artificial Intelligence: Expectations, Rules and Achievement,” which began with introductory remarks by Congresswoman Mariannette Miller-Meeks (R-Iowa) who questioned whether the federal government had AI experts who understood the innovations. “These are disruptive technologies,” she said. “What will it do to our healthcare system? With autonomous vehicles, do we have the relevant policies in place for government and insurance companies?” She also worried about competition in the space. This jump-started a panel discussion on the numerous opinions involving AI. [Continue reading CES: Panel Reveals Surprising Statistics on Perceptions of AI](#)

Google Pushes Cross-Platform Functionality for Android

Alphabet’s Google is making its Fast Pair Service and Chromecast capabilities more interoperable as well as improving functionality with third-party devices that use



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Google's own Android OS, Wear OS or Chrome OS and third-party platforms such as Microsoft Windows, Amazon's Matter smart home standard, and others. In 2021, the average household had 25 connected devices, up from 11 in 2019, and Google wants to free users "to pick and choose the devices that work best for you regardless of brand," says Google vice president of multi-device experiences Erik Kay. [Continue reading CES: Google Pushes Cross-Platform Functionality for Android](#)

Remote Work Advances Adoption of Smart Home Tech

The smart home sector has been evolving for at least a decade but when COVID-19 created the necessity for remote working, millions of people had a personal and very eye-opening experience in their homes. CTA senior director of member programs Melissa Matalon led a discussion with Michael D. Ham, president and co-founder of global wellness company RePure, and Ian Bryant, senior director of strategic partnerships at CEDIA, the trade group for the home technology industry. "A decade ago, health and wellness wasn't relevant to smart homes," noted Ham. "Now that people are spending so much more time at home, wellness is on everyone's minds," said Matalon.

[Continue reading CES: Remote Work Advances Adoption of Smart Home Tech](#)

Atmosphere Brings TikTok Mobile Video to New Venues

Atmosphere — a startup that curates streamed video content for commercial venues including Westin Hotels & Resorts, Taco Bell and Texas Roadhouse restaurants, as well as gyms, spas, airports and other places people congregate — has entered into a deal with TikTok to offer clients a channel programmed with the popular app's short-form clips. The offering will be distinct from TikTok TV, launched in November as the mobile app's first dedicated foray onto television screens and now available via Amazon Fire TV, LG and Samsung smart TVs, Google TV and other Android TV devices.

[Continue reading CES: Atmosphere Brings TikTok Mobile Video to New Venues](#)

Nvidia Optimizes Studio Laptops for Creatives, VFX Pros

Citing laptops as the fastest-growing PC platform, Nvidia is doing its part to ensure gamers and creators can keep up, unveiling 160 new models equipped with its GeForce RTX GPUs at CES 2022. More than 100 of them are AI-powered Nvidia Studio laptops, optimized for creatives and VFX professionals. After four years in beta, Nvidia is making its Omniverse platform free to individuals and introducing cloud-based collaboration capability as the company stakes its claim on creating for the multiverse. Omniverse lets creators use different typically incompatible software packages in one workflow in real time. [Continue reading CES: Nvidia Optimizes Studio Laptops for Creatives, VFX Pros](#)

An Update on the U.S. Rollout of ATSC 3.0 NextGen TV

ATSC president Madeleine Noland presented a "virtual tour" of NextGen TV at CES 2022, where it is again located in the Las Vegas Convention Center lobby. She revealed that, in addition to three displays showing off NextGen TV's improved visuals, audio and interactivity, ATSC will also highlight products from Gaian Solutions, LG Electronics, Pearl TV, Samsung, Sony and Sinclair Broadcast Group. She also interviewed three executives on their NextGen launches and other activities from 2021 as well as their upcoming plans for 2022. [Continue reading CES: An Update on the U.S. Rollout of ATSC 3.0 NextGen TV](#)

Lawmakers Grapple with 5G as Deployment Continues

Deploying 5G spectrum through rural America has national security and social equity implications, say legislators struggling to keep up with rapid technology changes as the government allocates \$65 billion to broadband through 2021's Infrastructure Investment and Jobs Act. Although 5G is here when it comes to cell phone communication in dense areas, there are unmet mobile needs that range from farming to emergency response and the build-out is big business. The FCC's 3.45-3.55 GHz mobile spectrum auction in Q4 2021 raised \$22.5 billion for the Treasury Department. That follows \$80.9 billion raised in a C-band auction early last year. [Continue reading CES: Lawmakers Grapple with 5G as Deployment Continues](#)



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Case Studies on How Gaming Tech Can Improve Health

Much has been written on how gaming can be an incentive to change behavior. But can it also be used to clinically improve health outcomes? Lygeia Ricciardi, founder and chief executive of AdaRose — “a community of powerful women who are maximizing self care, health and wellness” — gathered executives at CES who said their companies have successfully used gaming to improve health for numerous use cases including pain reduction, aid in concentrating, lower drug reliance and more medical compliance as well as generally improved levels of well-being. [Continue reading CES: Case Studies on How Gaming Tech Can Improve Health](#)

Stakeholders Debate the Complex Issues of Privacy 3.0

During CES this week, CTA senior vice president of political and industry affairs Tiffany Moore led a discussion on the contentious issues surrounding privacy in an evolving digital landscape. With her, former FTC acting chair Maureen Ohlhausen was joined by Asad Ramzanali, legislative director to Representative Anna Eshoo (D-California), and Dr. Carlos Nunez, ResMed chief medical officer. Ohlhausen noted that the FTC is the primary agency tasked with privacy issues, based on a 1938 law passed by Congress prohibiting “unfair and deceptive acts or practices.” [Continue reading CES: Stakeholders Debate the Complex Issues of Privacy 3.0](#)

Buttigieg Says Tech Calls for New Government Thinking

The U.S. “must reinvent the machinery of government itself, just as much as any piece of transportation equipment,” U.S. Secretary of Transportation Pete Buttigieg said Thursday in his CES speech on the Future of Transportation. “Innovation isn’t about the technologies themselves, but how we deliver transportation resources cost-effectively and quickly,” Buttigieg said, sharing his vision for an Advanced Research Projects Agency for Infrastructure, “ARPA-I, modeled after DARPA” (the Defense Department ARPA

that invented the Internet) as required in an era in which mobile connectivity and transportation are becoming inextricably intertwined. [Continue reading CES: Buttigieg Says Tech Calls for New Government Thinking](#)

Connectivity and Data Fuel Innovations in Digital Health

Pioneering tech journalist Robin Raskin brought together six companies that have created innovative digital health products due to the increased use of data and connectivity. “Connectivity is a predictor of health,” said Raskin. “The more connected we are, the healthier we will be. Next, we need to get this technology out there as inexpensively and widely as possible.” Deloitte’s national consulting leader for life sciences and health care practices Dr. Lynne Sterrett outlined five macro trends: interoperable data, equitable care, owning our own data, the use of data to inform behavior change, and science as the winner during the pandemic. [Continue reading CES: Connectivity and Data Fuel Innovations in Digital Health](#)

Panelists Chart the Growing Popularity of Social Audio

The voice could be described as the original mass media and, as social audio, it is now the latest trend. United Talent Agency executive director of audio Kristin Myers moderated a CES 2022 panel discussion on the topic with Clubhouse head of community and creators Stephanie Simon and Audio Collective co-founder Toni Thai Sterrett, who offered up the definition of social media as “live group audio.” “And the key is the sense of participation and interactivity,” she said. Simon added that, “we’re social media based on audio.” [Continue reading CES: Panelists Chart the Growing Popularity of Social Audio](#)

GM Chief Details Ambitious EV and Autonomous Plans

General Motors chair Mary Barra outlined a future of zero emission EVs and emphasized the Ultifi software platform to keep GM drivers connected during her virtual CES keynote that centered on the 2024



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Chevrolet Silverado EV and ended with futuristic Cadillac concept vehicles including air transport. She predicts 50 percent of GM's factory production in North America and China will be all-electric by 2030 and that the company will deliver personal autonomous vehicles "as soon as the middle of this decade." Helping GM's more immediate plan to lead EV market share are Chevy's 2023 Equinox and Blazer EV SUV models.

[Continue reading CES: GM Chief Details Ambitious EV and Autonomous Plans](#)

Canon Intros Hybrid Meeting Software and VR Solution

Inspired by two years of challenging remote work environments due to COVID-19, Canon announced it is developing AMLOS (Activate My Line of Sight), a hybrid meeting software solution enabled by its image processing technology. The company has also teamed with actor and producer Joseph Gordon-Levitt and his company HitRecord to show how this technology can help create a virtual, real-time writers' room. At CES 2022 in Las Vegas, Canon defined its offerings under the rubric "TogetherNext," to demonstrate how interactive digital experiences connect people and cultures. [Continue reading CES: Canon Intros Hybrid Meeting Software and VR Solution](#)

Intel on AV Overdrive, Touts Fastest Mobile Game Chip

Intel laid claim to the 'world's best mobile gaming platform' with its 12th generation Alder Lake H-series GPUs at CES 2022, then shifted to overdrive to focus on autonomous driving, introducing its Mobileye EyeQ Ultra, AV-on-chip supercomputer offered as a full-stack AV driving solution. Intel in December announced plans to spin off Mobileye in an IPO sometime this year and used its CES press conference stage to demonstrate it is prepared to deliver, announcing a partnership with Zeekr to create all-electric AVs for the Chinese market, due to roll off the assembly line in 2024. [Continue reading CES: Intel on AV Overdrive, Touts Fastest Mobile Game Chip](#)

Qualcomm Targets 5G, Auto, Edge Computing, AR, VR

During CES 2022, Qualcomm president and chief executive officer Cristiano Amon announced that the company intends to focus on the connected intelligent edge, which he says is a \$700 billion market. "We're becoming the partner of choice for the edge," he declared. "We continue to see momentum across key opportunities." The company's momentum encompasses next generation Arm PCs, virtual and augmented reality, including a continued partnership with Meta, wireless fiber and the automotive sector. The latter includes new deals inked with Volvo, Honda and the Renault Group. [Continue reading CES: Qualcomm Targets 5G, Auto, Edge Computing, AR, VR](#)

Hyundai Envisions 'Unlimited Mobility of Things' Future

During CES 2022, Hyundai Motor Company presented a compelling vision of the future that blends the metaverse, the Internet and robotics to make time, distance and the distinction between the physical and virtual worlds irrelevant. The company's media event started with videos of a robotic platform concept that could be built into furniture for dynamically reconfigurable rooms. The platform technology could also carry people in personal mobility pods and power autonomous vehicles. Hyundai describes its vision as the "unlimited mobility of things." [Continue reading CES: Hyundai Envisions 'Unlimited Mobility of Things' Future](#)

In addition to ETC's original reporting, the following pages provide a curated set of articles...



ALSO NOTED...

In addition to ETC's original reporting, the following pages provide links to articles from other publications published before, during and immediately after the show, curated by ETC consultant Dennis Kuba and ETC staff. You will find these headlines linked to their sources and cataloged by relevant categories.

General

[Consumer Tech Sales to Hit \\$505B in 2022, CES Owner Forecasts](#)

[User-Generated Content Represents 39% of Time Spent with Media: Study](#)

[What It's Like at One of the World's Biggest Tech Trade Shows as Omicron Surges](#)

[What CES 2022 Taught Us About the Future of Trade Shows](#)

[3 Tech Trends at CES 2022 That Will Shape the Future of Business](#)

[The Best of CES 2022 - Engadget](#)

[The Best of CES 2022 - Wired](#)

[Digital Trends' Top Tech of CES 2022 Awards](#)

[The Verge Awards at CES 2022](#)

[Best of CES 2022: New Tech That's Practical, Innovative or Just Plain Crazy - Wall Street Journal](#)

[The Best of CES 2022: These Are the Tech Products to Watch - CNN](#)

[Best of CES 2022: The Most Innovative Hardware Coming Soon - Tom's Hardware](#)

[The 10 Best Gadgets of CES 2022 - Time](#)

[The CES 2022 Trends We'll All Be Talking About This Year](#)

[CES 2022: 5 Takeaways from the Giant Tech Trade Show - Adweek](#)

[Best of CES 2022: Hybrid Tech for a Hybrid World - Rolling Stone](#)

[Politico: Top Takeaways from CES 2022](#)

[The Weirdest Tech We Spotted at CES 2022](#)

[All the Smart Home Gadgets Worth Knowing About from CES 2022](#)

[The Best, Coolest, and Weirdest Gadgets at CES 2022 \(Slideshow\)](#)

Automotive and Mobility

[BMW Will Debut iX M60, Color-Changing Exterior Tech at CES](#)

[Qualcomm Is Expanding Its Automotive Platforms with New Volvo, Honda, Renault Deals](#)

[Volvo Says Qualcomm's Car Chipsets Will Make Its Infotainment System Twice as Fast](#)

[Intel's Mobileye Announces New EyeQ Ultra System-on-a-Chip for Autonomous Driving](#)

[Deere Rolls Out Fully Autonomous Tractor at CES](#)

[Auto Makers Supercharge Move into Electric Vehicles](#)



ALSO NOTED...

[Hyundai Imagines a World in Which It Has Turned Everything into a Robot](#)

[At CES, Hyundai Sees Boston Dynamics Robots as a Part of the Metaverse](#)

[Sony Shows Off SUV, Will Explore Building Electric Cars as 'Sony Mobility Inc.'](#)

[Amazon and Stellantis Partner to Deploy Smarter Cars, Cleaner Vans](#)

[Watch Hyundai's CES 2022 Robot Show in Under 6 Minutes](#)

[Watch GM's Silverado EV Reveal in 10 Minutes](#)

[GM's BrightDrop Brings on Walmart as New EV Customer as FedEx Ups Existing Order](#)

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Cameras

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Computers and Processors

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Displays and Televisions

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Phones

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