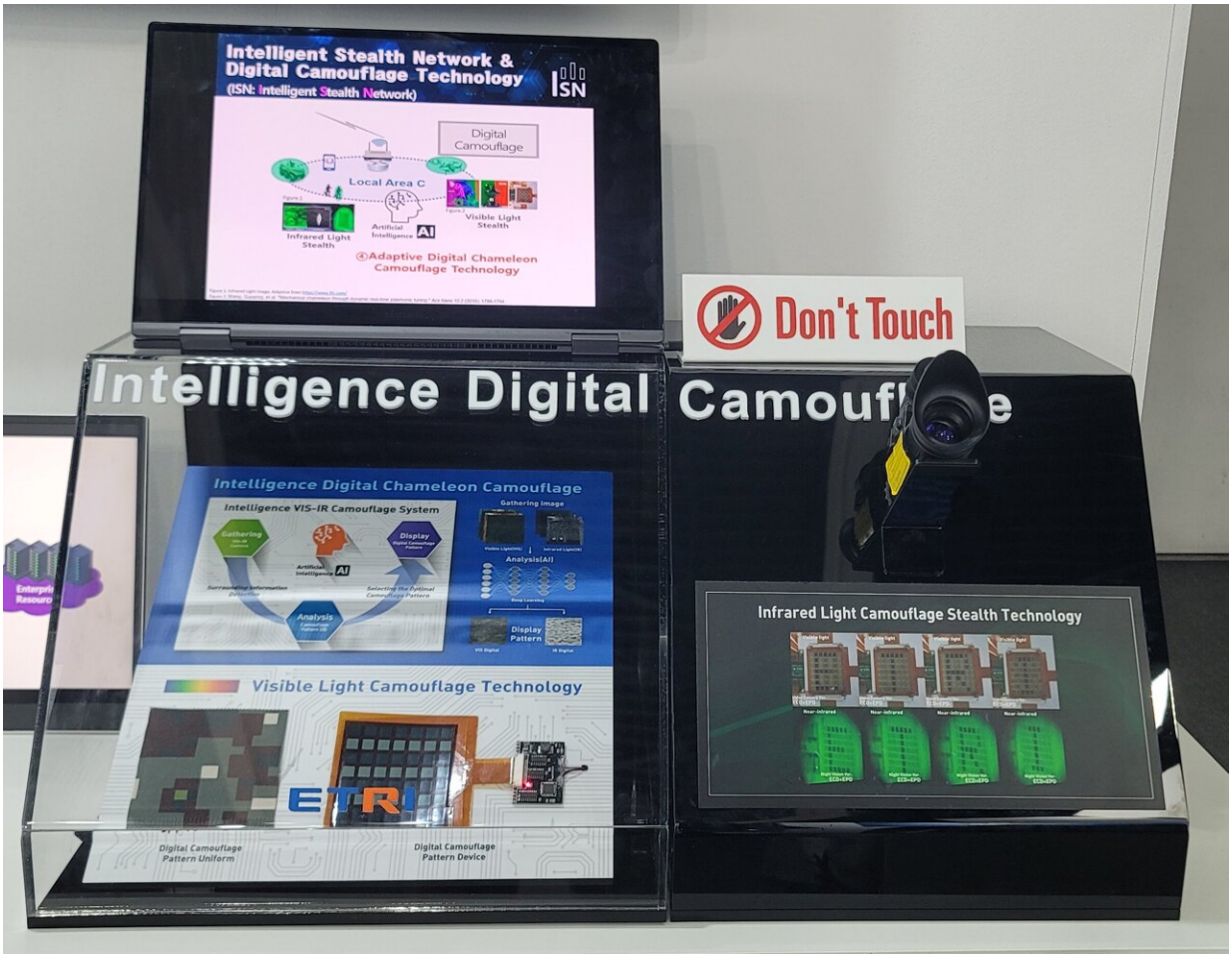
Unveiling hyper-realistic technologies for the metaverse world

September 25 2023



Metaverse. Credit: Electronics and Telecommunications Research Institute (ETRI)

In August 2023, the Electronics and Telecommunications Research Institute (ETRI) participated in consecutive events, starting from the 16th August at COEX in Seoul for "K-Display 2023," followed by "IMID 2023" at BEXCO in Busan from the 23rd. At these events, ETRI exhibited a variety of innovative technologies capable of realizing a truly realistic metaverse world.

At this exhibition, ETRI unveiled a total of 11 technologies across four categories, including hyper-realistic displays, converged displays, stereoscopic image creation and services, and 3D stereoscopic shape inspection equipment.

In the realm of hyper-reality displays, OLED-on-silicon micro-display technology to realize realistic virtual reality in extended reality (XR) devices for metaverse, and quantum dot color conversion display technology to implement high resolution and high color purity displays were introduced. It also introduced M3D technology to implement XR devices that are light, thin, and low in power consumption.

In the field of converged displays, stretchable circuit technology to realize freeform displays that can be applied to space and objects according to various needs of users, and electrochromic display technology that can be applied to various infotainment inside a self-driving vehicles and controls transmittance were displayed.

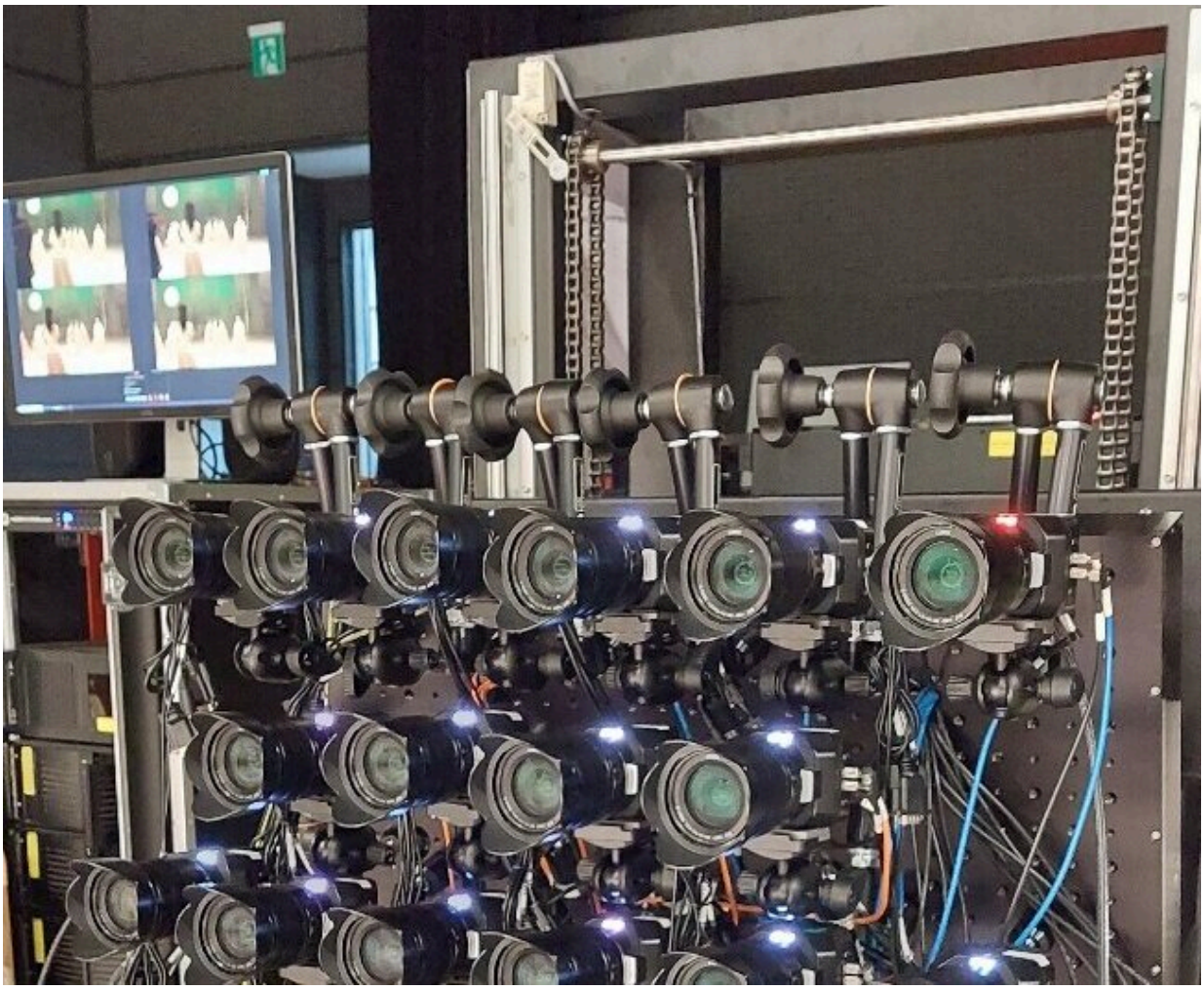
It also showed intelligent stealth display technology that can minimize exposure to enemies day and night by displaying visible or infrared images that are attached to the surface of military equipment and harmonize with the surrounding environment.

In the realm of stereoscopic image generation and services, it displayed plenoptic content acquisition, generation, authorization, and visualization platform technology that supports binocular, motor parallax, and focus

adjustment, as well as OTT player intelligence technology through automatic generation of artificial intelligence-based multi-view objects.

It also introduced hologram camera and processor technology that can produce real image acquisition holograms and computer-generated holograms in real time.

In the field of a 3D stereoscopic shape inspection equipment, it displayed 3D stereoscopic shape inspection technology that can precisely obtain 3D shape information of fine devices in semiconductor chips or display panels through hologram technology and accurately inspect defects. It also introduced 3D plenoptic microscope technology that can easily inspect the three-dimensional shape of a device in process in real time by attaching a lens similar in structure to an insect double eye to a general camera.



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In addition, it introduced ETRI's display production batch process platform and the results of supporting materials, components, and equipment companies achieved through it.

Over the years, ETRI has established a collective process service platform that encompasses display panel design, production, and evaluation through voluntary cooperation among researchers.

Furthermore, ETRI is contributing to enhancing corporate technology competitiveness and building an industrial ecosystem. Since 2020, it has been operating the Display Panel Technologies National Laboratory (N-LAB) to provide 22 companies with materials, components, and equipment verification, prototype manufacturing services, and practical manpower training.

ETRI's Dr. Lee Jeong-ik, Senior Vice President of the Hyper-Reality Metaverse Research Laboratory, expressed his commitment to further advancing core display and metaverse technologies included in the 12 national strategic technologies and six priority strategic technologies selected by ETRI. He emphasized the importance of fulfilling their mission to propel the hyper-reality metaverse world forward.

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