

Press Information

Kyocera introduces new Human Augmentation Technology Prototypes in Japan with advanced AI to enhance human abilities

The Company introduces the first 3 Human Augmentation solutions: Walk Sensing and Coaching, Physical Avatar, and Auditory Augmentation Devices.

Kyoto/London, 10. November 2022. KYOCERA Corporation has announced the development of three new solution prototypes in Japan for human augmentation: a Walk Sensing and Coaching System, a Physical Avatar, and an Auditory Augmentation Device. All three solutions are based on the concept Mai created by Kyocera's Future Design Laboratory. Human augmentation uses advanced artificial intelligence (AI) and other technologies to enable new experiences and skills by complementing and improving human abilities. The systems are meant to enhance human perception, cognition, and motor skills as well as improve human presence and interaction. Kyocera's technology is expected to benefit multiple fields, from the healthcare and medical sectors to entertainment and manufacturing.

Introducing Mai, Kyocera's New Human Augmentation Concept

The Future Design Laboratory of Kyocera's R&D division launched the new Mai concept for human augmentation. The laboratory's mission is to "Contribute to a safer and more prosperous life with technology that supports and enhances human abilities." Mai symbolizes how this technology creates possibilities for new human experiences. It may be compared to how a story develops dynamically in the context of subtle action in ["Noh" theater](#), the traditional Japanese art form that relies heavily on similes and metaphors expressed through movement.



First Three Solution Prototypes Introduced Under the Mai Concept

Kyocera has developed three solution prototypes to enhance human perception, cognition, and motor skills while improving human presence and interaction.

1. Walk Sensing and Coaching System: Promoting optimal posture and walking for motor skill augmentation and wellness

Using three wearable sensors (wrist, ankle and ear), Kyocera's AI technology monitors the user's walk and provides coaching instructions to improve posture and stride.

2. Physical Avatar: Enhancing remote interaction with in-office co-workers through presence augmentation

Employees working remotely can be represented by physical avatars placed in the office, enabling more natural visual and audio communication with their colleagues.

3. Auditory Augmentation Device: Auditory environment monitoring device enables audio playback for perception and cognition augmentation

The headset device monitors a person's surroundings, enabling the wearer to instantly play back a missed cue, such as a train or flight announcement. The device supports attention and memory enhancement and can help reduce stress.

Kyocera will continue to develop technologies to enhance human abilities, contributing to personal safety, convenience, and a higher quality of life.

Solutions' Description

1. Walk Sensing and Coaching System

Kyocera's Walk Sensing and Coaching System enables optimal walking technique by sensing, diagnosing, and coaching the user's walk, i.e., coordinated stride and pace. The system measures posture using data from wearable sensors on the ear, wrist, and ankle, providing real-time diagnosis and coaching through an earpiece while the user walks. The system was developed in collaboration with Wacoal Corp. (hereinafter Wacoal), a famous women's luxury fashion brand in Japan. As part of its product development, Wacoal has researched the human body structure since 1964, analyzing over 1000 subjects annually. In some cases, Wacoal has accumulated over 40 years of continuous data on identical people. By joining together on this development, Kyocera and Wacoal aim to help users achieve a healthier walking stride and higher quality of life.



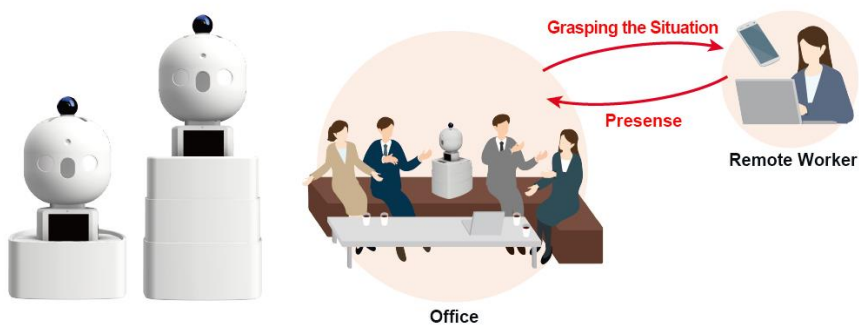
Attached wearable sensors



Walking animation and impression evaluation

2. Physical Avatar for remote work

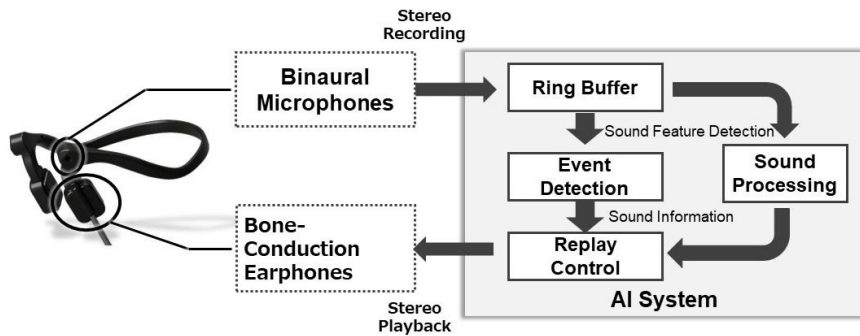
Even after COVID-19, new trends in remote work are here to stay. However, the challenge of feeling disconnected from in-office colleagues has become a focus for many corporations and workers. Remote workers have difficulty participating in casual office conversations, which can lead them to feel overlooked by colleagues connecting with each other in a physical location. Likewise, on-site colleagues may feel isolated from remote workers who miss important social cues in conversation. Kyocera's new Physical Avatar provides an in-office physical representation for the remote worker. In addition, through a 360-degree camera and micro phone array, remote worker can easily grasp the office's environment remotely. Remote workers can respond to office surroundings through the avatar by changing its height, nodding, and turning its head to physically interact with colleagues. The avatar can help enhance connections between remote workers and on-site colleagues to reduce stress and facilitate better overall hybrid office communications.



Physical Avatar (left) and use-case rendering (right)

3. Auditory Augmentation Device

Of the many sounds that surround us in everyday life, it is difficult for humans to process more than a few sounds simultaneously. Kyocera's new Auditory Augmentation Device continuously monitors the user's environment and alerts them of information requiring closer attention. The device combines bone-conduction earphones and binaural microphones¹ with an AI system. By recording the auditory environment and alerting the user to important sounds, they can play back important audio quickly and easily to catch up on what they missed. Anywhere multi-tasking occurs, such as in healthcare, hospitality, the office, busy train stations, and airports, this device can help enhance auditory perception and retention of important information, supporting attention, memory, and cognition.



Mechanism of the Auditory Augmentation Device

¹ Binaural microphones record sound using microphones near both ears to reproduce a realistic listening experience.



For more information on Kyocera: www.kyocera.co.uk

About Kyocera

Headquartered in Kyoto, Japan, KYOCERA Corporation is one of the world's leading manufacturers of fine ceramic components for the technology industry. The strategically important divisions in the KYOCERA Group, which is comprised of 298 subsidiaries (as of March 31, 2022), are information and communications technologies, products which increase quality of life, and environmentally friendly products. The technology group is also one of the most experienced producers of smart energy systems worldwide, with more than 45 years of know-how in the industry. The company is ranked #665 on Forbes magazine's 2022 "Global 2000" listing of the world's largest publicly traded companies.

With a global workforce of over 83,000 employees, Kyocera posted sales revenue of approximately €13,42 billion in fiscal year 2021/2022. The products marketed by the company in Europe include printers, digital copying systems, semiconductor-, fine ceramic-, automotive- and electronic components as well as printing devices and ceramic kitchen products. The KYOCERA Group has two independent companies in the United Kingdom: KYOCERA Fineceramics Ltd. and KYOCERA Document Solutions Ltd.

The company also takes an active interest in cultural affairs. The Kyoto Prize, a prominent international award, is presented each year by the Inamori Foundation — established by Kyocera founder Dr. Kazuo Inamori — to individuals worldwide who have contributed significantly to the scientific, cultural, and spiritual betterment of humankind (approximately €710,000* per prize category).

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