



Press Release

IMMERSIVE EXPERIENCE: LIST TO DEMO MULTIMODAL HUMAN- MACHINE INTERACTION AT CES 2018 WITH A NEW HAPTIC SYSTEM

The MATISS System Will Highlight Force-Feedback Sensations for Gaming, Medical, Drone and Automotive Applications with Interactive Touch Technology

PALaiseAU, France – Dec. 20, 2017 – List, a research institute of CEA Tech focused on smart digital systems, will demonstrate a new human-machine interaction system at CES 2018 that enhances the immersive and awareness-raising capacities of joysticks and video-game controllers, among other applications.

The MATISS system transmits high-quality information via haptic-based touch, an interactive, kinesthetic technology that transfers information to humans through vibration, resistive force, motion and other physical sensations. The demo will feature a rotary knob that is dynamic, fully programmable in real time and that can reproduce force-feedback sensations thanks to the use of a phase transition fluid (from liquid to solid and vice versa), which enhances user experience.

In video games, for example, users receive haptic feedback, or force feedback, via resistance to manipulation transmitted by the joystick based on what users are seeing on the screen. On tablet screens or smartphone displays, haptic feedback can create the sense of texture on the smooth surface.

List's technology is highly transparent, meaning users manipulating a joystick or other control feel no mechanical friction to remind them they are using a device.

At CES, the MATISS demonstration will allow users to turn the rotary knob while watching a computer screen. They will experience unlocking a safe, inserting a needle in a person for an injection and guiding a rolling ball through a setting with various obstacles.

"The haptic demonstration faithfully reproduces force-feedback sensations with a passive brake system that provides resistance," said Moustapha Hafez, head of the Sensory and Ambient Interfaces Laboratory at CEA List. "The knob transmits concrete, conscious information to the user, while enhancing the immersive sensation of a simulator or video game."

In addition to gaming and the applications demonstrated at CES, applications for MATTIS technology range from transportation to construction to manufacturing. Sensors provide information on surroundings and the haptic system creates force feedback that guides the operator. These applications include:

- Driving or operating assistance for cars, buses, trucks, agricultural vehicles, construction machinery, planes, helicopters and submarines... to guarantee safe operation in response to obstacles detected by sensors
- Controlling drones and unmanned aerial vehicles (UAVs) as the operator feels the effect of wind and proximity to obstacles
- Controlling of a variety of robot types remotely and
- Training surgeons for medical procedures using virtual reality.

"This fully reprogrammable haptic-feedback system is flexible for many applications in transportation, industry, medicine and gaming," said Hafez. "With this technology, we are able to simulate high fidelity, rich haptic feedback for machinery-or-equipment users and operators, and we can reprogram different types of interactions immediately."

MATISS stands for Magneto-Textural Inertial Spinning System.

See demonstrations by Leti, List and Liten (institutes of CEA Tech) at the CEA Tech Village, booth 50653 in Eureka Park.

About List

List, an institute of CEA Tech, the CEA Technological Research Division, carries out research on smart digital systems. Working on major economic and social challenges, its R&D programs focus on advanced manufacturing, embedded systems, data intelligence and technologies for digital patient applications. By developing advanced technologies, CEA List enhances the industrial competitiveness of its partners through innovation and technology transfer initiatives. Thanks to the quality of its joint research programs, CEA List joined the Carnot Institutes network in 2006. For more information visit: www-list.cea.fr.

CEA Tech is the technology research branch of the French Alternative Energies and Atomic Energy Commission (CEA), a key player in innovative R&D, defence & security, nuclear energy, technological research for industry and fundamental science, identified by Thomson Reuters as the second most innovative research organization in the world. CEA Tech leverages a unique innovation-driven culture and unrivalled expertise to develop and disseminate new technologies for industry, helping to create high-end products and provide a competitive edge.

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