PIEZO4HAPTIC

AUTOMATED FEEDBACK FROM **ULTRA-THIN PIEZOELECTRIC ACTUATORS**

WHAT IS PIEZO4HAPTIC

A haptic interface is a new type of man-machine interface, which allows the user to interact with the environment using his/her sense of touch.

Integrated piezoelectric actuators make the demonstrator screen vibrate imperceptibly based on a vibration mode of several tens of kHz. Vibration allows the user to feel complex haptic effects such as texturing or relief.
The piezoelectric actuators are composed of 2µm thick, aluminum nitride (AIN) deposited in ultra-thin layers.

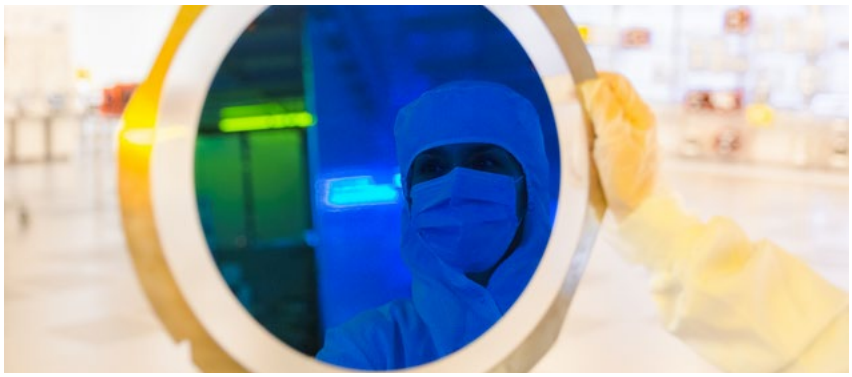
APPLICATIONS

All man-machine interfaces can be potentially enhanced by introducing a haptic effect. For example:

- Haptic smartphones
- Textile technology: virtually touching a garment on internet on a computer screen
- Automotive technology: introducing haptic buttons to car dashboards.

WHAT'S NEW?

Most demonstrators involving friction modulation use piezoelectric ceramics, which need to be glued manually to the screen. CEA-Leti is leveraging its 200mm technological platform to deposit and etch actuators based on collective technologies, thereby ensuring time savings and low costs. The Institute is also offering a miniaturized solution via its ultra-thin piezoelectric actuators smaller than 3µm versus 100 µm for current commercial ceramic actuators. CEA-Leti's thin layer actuators require only small actuation voltages, which also allow better integration.



CES 2020

At CES 2020, Grenoble-based start-up Hap2U introduced a haptic smartphone, based on the same haptic friction modulation effect used in CEA-Leti's demonstrator

WHAT'S NEXT?

CEA-Leti is developing other actuator integration strategies, in particular CHIP-IN-FLEX, a technology allowing integration of piezoelectric actuators into a flexible substrate. CHIP-IN-FLEX will enable the haptic effect to be applied to curved and conformable surfaces by increasing actuating performance.

The Institute is also working on the development of technology that is capable of making piezoelectric actuators completely transparent.

INTERESTED IN THIS TECHNOLOGY?

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