HIGH PERFORMANCE VIBROTACTILE ACTUATOR

ITC

MARKET CHALLENGES

Sense of touch can be stimulated in several ways: by skin deformations, by vibrations, by electric stimulations, by skin stretching, by friction. Generally, **the useful band for the sense of touch covers all frequencies up to 1 kHz and can achieve 10kHz.**
The various mentioned tactile stimulations are produced by haptic interfaces means. These are acclaimed to add precision to a movement, realism in a situation, sensibility in an object, to find the "common" reflexes, to remotely manipulate robots, etc.
These **haptic interface devices** lean on various technologies. Yet, the latter **present important limitations** such as **too narrow bandwidth** entailing, impoverished tactile rendering, **limited miniaturization, high cost**, etc.

INNOVATIVE SOLUTIONS

The developed actuator consists of a voice-coil vibration motor. These motors incorporate coils and magnets which interact by generating an electromagnetic strength. This strength is used here to generate mechanical vibrations. Voice-coil motors work on bands of several hundred Hertz. They allow in particular to create **very rich tactile rendering**, allowing to approach the interaction with a real object.

The developed engine can cover an important part of the human tactile sensibility interval (up to 10 kHz), with **high performances.**

SUGGESTED APPLICATIONS

- **Connected devices:** objects of our everyday life can be differently perceived if appropriate vibrations are exercised. For example, a wooden table can be perceived as deformable. Thanks to this novel actuator, this kind of connected devices could be created
- **Video games:** this novel technology allows the user to feel the backward movement of a firearm, a vehicle acceleration or the noise of a baseball bat hitting the ball
- **Medical field:** tactile feedback is also very interesting in medical robotics where the need for precision is very important
- **Mobile phones:** the technology can be used for the creation of virtual textures to be touched on touch-sensitive screen and, more generally, on diverse surfaces and supports. For example, well programmed vibrations can modify our perception of a smooth surface, as can be the screen of a smartphone or a tablet, making it more or less rough and creating tactile images.
- **Loudspeaker:** this novel motor can generate perceptible frequencies as well in touch as in hearing. Indeed, it can produce simultaneously tactile and hearing rendering. So, putting it on a surface, it can serve as a portable loudspeaker

DEVELOPMENT STATUS

Several prototypes of connected devices have already been made (dice, glass), to offer an immersive multisensory experience …

COMPETITIVE ADVANTAGES

- **Rich tactile rendering**
- **Higher performances**
- **Team of reputed researchers:** M. Hayward is a Key Opinion Leader in the haptic domain
- **Industrial marks of interest:** last year, 200 actuators were sold to a Canadian company "Tactile Labs" which distributes electronic components, mainly to research laboratories
- **Reduced size**
- **Wide bandwidth**
- **Low cost**

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IP PROTECTION

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