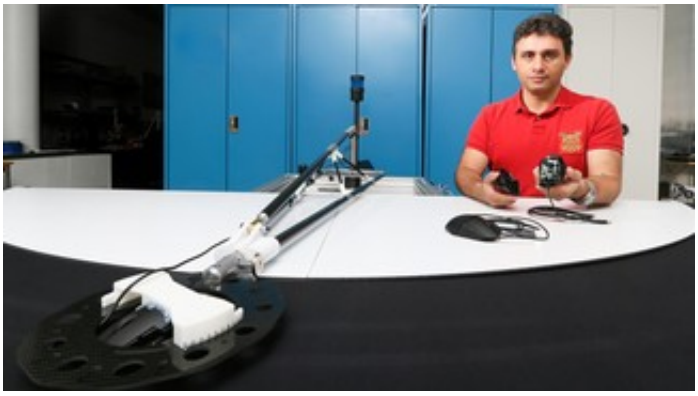
A mouse that plays off gamers' super-quick motions

April 29 2015, by Cécilia Carron



Credit: Alain Herzog

An EPFL post-doctoral student at Logitech has developed an algorithm that gives a mouse a nearly-unlimited reaction rate. It facilitates the combining of optical sensors with a system based on accelerometers and gyroscopes. Already on the market, this device is a successful example of collaboration between research and industry.

From the outside, this powerful device looks like a conventional mouse: therein lies its strength. Although traditional in use, it can track a cursor – even when accelerating – that is moving at least five times the rate tolerated by its competitors. This supermouse is designed for amateur gamers and champions of professional e-sports alike. Caught up in the action, gamers actually perform very rapid movements with frequent

direction changes. This pushes an optical mouse to its limits.

An all-terrain mouse

The designer of this competitive mouse, Arash Salarian, worked in 2010 at the Laboratory of Movement Analysis and Measurement (LMAM) developing an all-terrain mouse that works as effectively on a special mat as on glass or any other surface. Optical sensors operate on the basis of successive images, and they require a minimum amount of contrast to function properly. Technology based on gyroscopes and accelerometers has the advantage of being usable even on the most uniform media. The prototype developed with this technology, called "inertial," functions very well at high speeds, but becomes less reliable when used in a traditional office.

The second advantage of rapid acceleration is that the technology can rebound toward hybridization to support seamless fights, chases or other crucial action scenes in a PC game. The idea of the CTI project that followed was thus to combine slow movements, using the optical camera algorithms, with high-speed motion, using inertial tracking. Hence, the name: "Fusion." A 32-bit microcontroller calculates the path every millisecond and commands the inertial system to take over after a certain appearance is reached. This enhanced mouse supports speeds five times higher than those of its counterparts.

Specifically developed tests

While gamers, according to blogs and specialized sites, appreciate a substantial difference in the fluidity of action when using this type of equipment, "it is very likely that it supports an even greater acceleration," says Arash Salarian, who now works at Logitech. "The one we measured only corresponds to the maximum test tools available." For

the record, the measurement tools traditionally used to calibrate the mouse are insufficient for measuring such high speeds. It is another EPFL lab (LASA) that certified the test equipment specifically developed by Logitech.

On the market, it's called "Logitech G402 Hyperion Fury Gaming Mouse." The mouse is one of many examples of products resulting from a collaboration between EPFL and Logitech, between applied research and commercial development, which has lead to innovative mass production for the global market.

Provided by Ecole Polytechnique Federale de Lausanne

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