Smart Sensor Technology for Precise, Real-Time Body-Motion Reconstruction

STMicroelectronics, a global semiconductor leader serving customers across the spectrum of electronics applications and the leading supplier of MEMS (Micro-Electro-Mechanical Systems) for consumer and portable applications, today unveiled a smart suit prototype with sewn-in new multi-sensor ST iNEMO® motion co-processor that recognize complex movements of the wearer's body and translate them to a digital model with outstanding precision and speed. The iBMR, iNEMO Body Motion Reconstruction technology could improve outcomes in clinical and sports medicine applications, as well as enhancing augmented reality where users could, for example, jog side by side with the world champion on their local running track.

The current-generation prototype of ST's body-motion reconstruction suit demonstrates the optimal performance of the miniaturized iNEMO multi-sensor nodes attached on each arm, forearm, thigh, calf, and two on the back; additional nodes can be mounted on hands, on shoes or on the head.

The integration of ST motion and magnetic MEMS sensors with a 32-bit STM32® microcontroller and dedicated software in one miniaturized solderable module with a very small size form factor (13x13x2 mm), make the iNEMO motion co-processor part of a flexible solution for effortless orientation estimation embedded applications.

Using ST's sophisticated data fusion software, each iNEMO smart sensor node represents one of the smallest and highest performance Attitude and Heading Reference System (AHRS) modules developed for the market. All nodes send their data to the control unit, which applies the measurements to a graphical skeleton

model and displays body motions in real time.

Extensive tests with realistic, complex human body motions have proven the outstanding precision and speed of ST's body-motion reconstruction suit, with deviation in spatial accuracy below 0.5 degrees during movements and the time needed to process and apply the sensor data to the skeleton model less than 15 milliseconds.

Samples of the iNEMO motion co-processor are available now. Please contact your ST sales office for pricing options and sample requests.

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