

RAPID EVALUATION AND PROTOTYPING

What kind of assessments is possible with wearable technology, today and tomorrow?
What type of sensors should be used?
What sensor range and sampling rate are appropriate? What are the sensor characteristics in a realistic situation? Can the sensor signal be calibrated and processed in order to mitigate the influence from an unstable environment?



We have the ability; the knowledge, the hardware and the infrastructure for test and verification, to find the answers.

The hardware platform Sport Gadget Integration Tool (SPOGIT) is offered for assessments in the early stage of the product development process of new wearable sport gadgets. It is designed to cover a wide range of inertia, that is, acceleration and angular rate, relevant to sport. The unit also has the possibility to connect to external sensors, for example, heart rate monitoring, EMG etc. All together the SPOGIT has 18 internal, plus 8 external sensor channels. It is equipped with USB interface, sub 2.4GHz radio, a serial flash, weight less than 10g, and fit onto a 36x23mm PCS (one side).

At Acreo Swedish ICT we are at the fore front of sensor technology development. Besides the SPOGIT hardware we also offer high-end sensor characterization and calibration, as well as sensor signal processing and algorithm development.

Sensor	Comments
Accelerometer	up to 400g, sample rate up to 1000Hz
Gyroscope	up to 4000dps ¹ , sample rate more than 1000Hz
Magnetometer	up to 1200uT
External	8 channels 12-bit ADC, for example, PPG ² or EMG ³

(1) Next generation, currently 2000dps

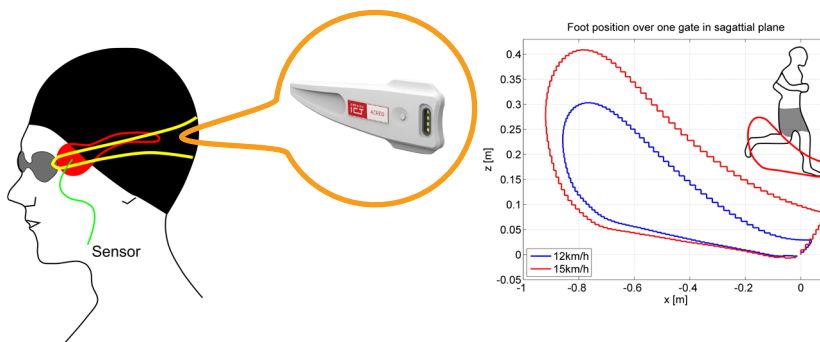
(2) Photoplethysmogram, for heart rate and oximetry.

(3) Electromyography, for muscular activity.

SPOGIT FOR PRODUCT DEVELOPMENT

Biofeedback from swimmers

There is a need from professional swimming coaches to assess biofeedback from swimming athletes. This information is important because it will allow them to adjust training intensity on individual level leading to higher performance and less injuries due to for example overtraining. Starting from the SPOGIT a product for swimming has been designed to measure: heart rate, heart rate variability, oxygen saturation and motion. Tractable data is transferred in real time to a receiver, for example, a coach with a hand-held device. The device is small and placed behind the goggle and under the swim cap, causing no discomfort for the wearer.



Unraveling details in the running gate

Using the SPOGIT we are designing a wearable motion monitor system for runners. The system captures kinematic data, acceleration and angular rate, at a number of spots, for example, on the runners: foot, knee or hip. We anticipate that the captured motion data could be used to assess a number of biomechanical parameters important for the runner, such as, pronation of the foot, impact in the foot stance, gate cycle characteristics, pelvis motion, and more. The data could be used to improve training, gain better running technique and perhaps avoid injuries and to motivate the runner. We remark that the motion monitoring should be possible for runners on the treadmill as well as on the trail, in the field or forest, thus running monitoring anywhere and anytime.

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- Advanced Test and Demonstration Milieus
- Small Scale Production
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- Seminars and Workshops

Contact us and let's talk about how we can create tomorrow's innovations combining ICT and Sports.

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Located in 12 cities in Sweden, Swedish ICT employ some 400 researchers, all of whom help to develop tomorrow's ICT solutions and integrated applications on a daily basis.

Internet of Sports at Swedish ICT merges the Swedish sport tradition with a high level of technology expertise in order to create exceptional products and services for better results and great experiences.