

Reaching new heights with connected skis

February 3 2016, by Cécilia Carron



Thanks to a small screen on their skis, backcountry skiers can see various data recorded by sensors as they ski. The length and number of turns going up, their cadence and even the symmetry of their steps appear on the device. It was developed by an EPFL spin-off that teamed up with a local equipment manufacturer.

The [device](#), which attaches directly to the skis, is small and light and

loaded with sensors. It is equipped with a screen that switches between showing various performance stats and data on the surrounding environment. Skiers working their way up the slope see in real time the length of their turns going up, their cadence, the symmetry of their steps, the temperature of the snow, and more. Skiers may use this info to modify their route, and they can even program objectives into the device. It was created by an EPFL spin-off and a local equipment maker.

The device includes an accelerometer, a gyroscope and a barometer. It is called the Pomocup, and its sensors can collect 1,400 pieces of data per second. It calculates the movement of the skis in 3-D relative to the slope – and relative to the other ski if each one is equipped with the device. "A particular detail of backcountry skiing means we can achieve good precision relatively easily: when one ski glides, the other is still for long enough to allow the algorithms to correct any errors," said Benoît Mariani, co-designer of Pomocup.

But doesn't the deep snow cover the little screen on the [skis](#)? "The routes are already cleared before competitors come through. Also, the rounded shape of the device means that snow quickly slides off the sides," said Mariani. For several years now, this cross-country ski buff has been developing, with his start-up, movement analysis sensors for medical, safety and sporting purposes. He started working on a preliminary version of this backcountry skiing device during his microengineering studies at EPFL. After linking up with Pomoca, which specializes in backcountry ski gear, he perfected the system.

Useful for mountain guides

The professional version of the Pomocup is meant for mountain guides, who can quickly be apprised of certain information without stopping or taking off their gloves in order to fish out other devices. "They'll be interested in data like the air and snow temperature and the slope incline,

in order to assess the avalanche risk," said Mariani.

Recorded data can be viewed on a smartphone, tablet or computer, using apps similar to those developed for running. This means that, once off the slopes, skiers can analyze their stats which can be of interest to professionals and non-professionals alike. And they can share their stats with friends via social media.

Provided by Ecole Polytechnique Federale de Lausanne

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