FRANÇAIS ENGLISH

Smart Ski Experience

PATENTS 2 PATENTS

A battery-free, connected device to enable a new way of learning, practicing and using skis

What is Smart Ski Experience?

The device, which is attached to the ski, includes a power sensor and a Bluetooth™ communication module.
It is powered by a piezoelectric energy harvester device that captures energy from the vibrations and micro-deformations of the ski.

The piezoelectric generator is used as a power sensor to estimate the effort applied by the skier. An artificial intelligence merges and analyzes data retrieved from both the onboard system and the smartphone.
The skier receives feedback about his or her overall technical skills and ski level, as evaluated by the Memento French Ski Teaching Method (*École Nationale du Ski et de l'Alpinisme*).

The system also collects data on the usage of the ski.
It was developed as part of a strategic partnership between Rossignol and CEA.

Applications

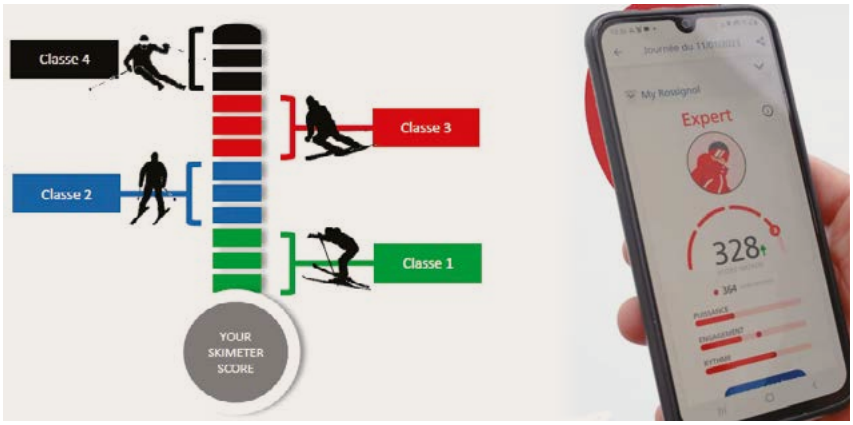
This innovation is based on CEA's expertise in embedded artificial intelligence (edge-AI) and mechanical energy harvester. It gives rise to a low-cost, battery-free system that can be used for a variety of applications in which movement is used to harvest energy:

- **snow sports**: snowboarding, sledge, bobsleigh, etc.
- **water sports**: sailing, rowing, kayaking, kitesurfing, windsurfing, etc.
- **walking and running**
- **road and mountain biking**
- **fitness and weight training equipment**

What's new?

Smart Ski Experience features many innovations:

- world's first battery-free power sensor solution that is integrated into the ski and assesses the skier's level
- a solution for tracking ski usage without a battery. This information can be used to extend ski lifespan or plan for its recycling
- a piezoelectric element used both as a power sensor and as an energy harvester
- ultra-low power electronic and firmware



Sensor on ski, smartphone application with edge AI algorithms ▼

What's next?

As part of a regional project in collaboration with Lumiplan, Smart Ski Experience was successfully tested by more than a hundred skiers on the slopes of Courchevel and Meribel during the 2023 World Ski Championships. It was also tested by several hundred skiers during other experiments. Rossignol considers to commercialize this innovative solution in the near future.

This technology can be adapted to other sports equipment.
To do so, it requires several steps: the estimation of available energy, the realization and validation of a prototype, and the industrialization of the device.

Interested in this technology?

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