

New Method of Recovering Avalanche Victims Created

The Galileo network will be key

By [Tudor Vieru, Science Editor](#)

2nd of December 2009, 20:04 GMT

A new tracking system that holds great promise in saving future avalanche victims has just been developed in Germany. The method, which was created by scientists at the Fraunhofer Institute for Material Flow and Logistics IML, will rely heavily on the future European satellite navigation system, Galileo. The team reports that its method will be able to pinpoint everyone carrying an avalanche transceiver or a cellphone, with a spatial resolution of just a few centimeters. This could provide search and rescue teams with a lot of help, and could increase victims' chances of survival. PhysOrg reports.

When trapped under an avalanche's debris field, people can only hope that someone starts digging for them soon. They need to be extracted within the first half an hour, otherwise their chances of survival diminish rapidly, and they perish under the snow. The key to a successful rescue is the avalanche beacon, which usually allows rescuers to pinpoint their location. "In the experience of rescue teams, not everyone actually carries beacons," IML expert Wolfgang Inninger says.

"However, nearly everyone has a cellphone. This is why we decided to enhance our automatic geolocation system that works with Galileo, the future European satellite navigation system," he adds. In order for this approach to work, Inninger reveals, the ARN (avalanche rescue navigator) system needs to receive two new functions. The first one is the ability to locate cellphones, and the second is a piece of software that needs to be able to calculate the victims' positions relative to the local environment. The system will also be able to calculate the exact distance between the victims' locations and the nearest rescue team, so as to minimize the response time.

For this amazing research, the team uses the GATE Galileo test and development environment, which is a gigantic research platform that simulates incoming signals from the future Galileo network. Six antennas are installed on just as many mountaintops, and all of them act like a member of the future satellite constellation. The goal of Europe's future grid will be to provide an alternative to the American GPS and the Russian Glonass. Member states of the EU will benefit from the advantages of the new satellites at smaller prices than if they were using the US variety.

Digital avalanche rescue dog

December 1, 2009

(PhysOrg.com) -- A novel geolocation system makes use of signals from Galileo, the future European satellite navigation system, to locate avalanche victims carrying an avalanche transceiver or a cellphone, to the precision of a few centimeters.

For many skiers and snowboarders, there is nothing quite like being the first to make tracks in the virgin snow, off the regular piste. But this can be a fateful decision, because the risk of avalanche is

many times greater here. Once buried under a mass of snow, a person's only hope of survival is if their location can be pinpointed swiftly. If not rescued within half an hour, their chances of being found alive diminish rapidly. Victims stand the best chance of being saved if the uninjured members of their group start searching for them immediately - but for that the buried victim needs to be wearing an avalanche beacon.

"In the experience of rescue teams not everyone actually carries beacons," says Wolfgang Inninger of the Fraunhofer Institute for Material Flow and Logistics IML. "However, nearly everyone has a cellphone. This is why we decided to enhance our automatic geolocation system that works with Galileo, the future European [satellite navigation](#) system." To do so, two new components have been added to the 'avalanche rescue navigator' ARN: a cellphone location function and software that calculates the position of the buried victim on the basis of local measurements. Starting from the approximate place where the victim is thought to be lying under the snow, the rescuers measure the field strength of the signal transmitted by the cellphone or beacon at three to five reference points. The system then uses a highly precise calculation algorithm to pinpoint the source of the signal, indicating with high probability the location of the buried victim. In this kind of situation, the position relative to the rescue team's starting point is more important than the absolute position relative to global coordinates, which may be subject to measurement inaccuracies. This gives the rescuers immediate information on the direction and distance from their present location at which the victim can be found.

For their development work on the system, the researchers are using the GATE Galileo test and development environment in Berchtesgaden, where transmitter antennas installed on six mountain peaks simulate the Galileo signals. The researchers intend to combine these signals - and the real ones, after 2012 - with signals from existing satellite navigation systems such as the American GPS and the Russian Glonass, and to add signals for error estimation and correction.

The project is being implemented by a consortium of regional companies, institutes and universities in collaboration with the Berchtesgaden mountain rescue service and the police, and is being sponsored by the German Aerospace Center DLR.

Provided by Fraunhofer-Gesellschaft ([news](#) : [web](#))