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 carrys 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)

Citation: Digital avalanche rescue dog (2009, December 1) retrieved 19 April 2024 from https://phys.org/news/2009-12-digital-avalanche-dog.html