



Radar Technology for Disaster Management

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In this contribution we address two projects in the area of radar technology for disaster management. The first one addresses the problem where people can be buried in collapsed houses or under sliding slopes due to severe storms, earthquakes or gas explosions. In order to rescue them, it is not only necessary to locate them quickly, but also to secure the area reliably in order to protect the emergency services from further collapses and falling debris. This requires systems that monitor the collapse site and detect movements of the building parts quickly and reliably. Therefore a radar-based system was developed and set up as a demonstration system. The system can be used to detect changes in parts of buildings or slopes without prior contact and without the need to attach measurement markers. It is a new type of radar system for observing concealed areas, which combines the main radar for overall monitoring with mobile secondary radars. This system allows for the localization of emergency forces and a spatially limited warning of persons in endangered areas.

The second project is concerned with the realization of a system of networked radar modules which, due to their compact design, can be placed in a distributed manner with a drone in the area to be searched. In order to maximize the detection performance, all transmitter/receiver combinations are used across and the data is fed into a common complex signal processing. The aim is to identify people on the basis of characteristic patterns, e.g. heartbeat or breathing, for example, and to localize them with the help of a mathematical analysis of the various signal paths. In addition, it was investigated to what extent the system also provides information about the state of health of buried victims, so that a prioritization of rescue measures can take place.

The two projects make a significant contribution to improving the safety of emergency forces and affected persons and to localize people in endangered areas.