360-degree Data of Earthquake Damage

After the earthquake which occurred in Van, Turkey, on 23rd October 2011, special cameras have been used to capture part of the disaster area in 360-degree imagery. The images were digitised using Netcad software in the scope of ABIS (Disaster Information System) Project. A two-strong team of experts using a special system with eight cameras mounted on a vehicle have captured the 360-degrees images of the area struck by the 7.2-magnitude quake.

The images were analysed in the scope of ABIS Project, operated by AFAD (Disaster and Emergency Management Presidency) in collaboration with Netcad, and guide the rest of the studies.

These 360-degree images were processed with a special 500-cored super-computer and were used for preliminary damage assessment studies. In this way, damage assessments were completed faster by the responsible institutions and disaster aid to be delivered to the territory was determined more affectively, including the compensations to be paid to the owners.

After the Van earthquake, all of the possibilities of today's modern technology were used to determine the extent of the damage precisely, thus improving the effectiveness and coordination of aid plans. For the first time in Turkey, the project has increased the speed and effectiveness of the disaster management processes.

All disaster data were collected rapidly and transferred to the centre, with inter-agency coordination provided by the "Disaster Information System"(ABIS) project, operated by Republic of Turkey Prime Ministry Disaster and Emergency Management Presidency (AFAD) in collaboration with Netcad software. The project aims to assess the housing needs and prevent any coordination problems during the aid delivery by accelerating the damage assessment and planned intervention processes. It also aims to determine the amount of compensation to be paid to the rights owners by arranging the damage assessment reports.

In this manner, a two-person team of experts was involved in an extensive study in the centres of the cities of Van and Ercis for three days (3rd-5th November 2011). They captured images of the disaster area in 360 degrees with a special system using 8 cameras equipped with special lenses.

It can collect data even travelling at speeds of 60 km/h by using the enhanced camera and positioning device mounted on the vehicle. It is possible to collect the data ten times faster than the classical methods. There are eight different 32-megapixel cameras, positioned four at the top and four at the bottom. They can collect stereo panoramic images in 8 million 3D dots per image or 24 million 3D dots per second. High-definition and georeferenced images or videos can be captured by Ladybug cameras with 5 lenses or Immersive Media cameras with 11 lenses. It is possible to collect the data in 2cm resolution with integrated Geodesic GPSs and IMU systems. These images can be used with maps by Netcad's Netgis|Server 360Pro solution. It also allows users to make measurements online. Digitisation, layer overlay and attribute entry are also possible with Netcad/360Pro desktop solution within the same environment.

Head of Department for Planning and Mitigation of Prime Ministry AFAD, Turan Erkoç, said in his statement that it is possible to reach higher details with 360-degree photographs than with satellite imagery and faster scanning periods for the damage assessments are also achieved.
Erkoç also stated that they pushed the button to use the 360-degree image-acquiring technology as a part of the ABIS Project in addition to the satellite imager: "Thanks to it, we determined the degree of the disaster impact faster, and arranged more efficient emergency plans in a shorter time." It was the first time as a pilot at Van and Ercis.

This R&D study has the intention to gather data on damage to buildings faster than before to ensure that the necessary measures and precautions are taken earlier. It is also the intention to enable the determination of the disaster hazards and risks for all the provinces, achieve advantages for the urban information system, and ensure that the implementation of the emergency plans runs more smoothly and effectively as a result.