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Extended SOSEWIN-Services

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The Self-Organising Seismic Early Warning Information Network (SOSEWIN) stands for several things. First it is a new approach of using wireless meshed networks equipped with sensors for dense environmental monitoring. Second it is a development technology using abstract model representations to simulate distributed protocols and generate application code, supported by a GIS-based management platform. Third SOSEWIN is also the name of a testbed installation of sensor nodes, based on the mentioned technologies, in Istanbul as a result of the project SAFER and EDIM.
Beside the capability to continuously process accelerometer sensor data for distributed earthquake early warning and rapid response functionality, new services based on the robust and independent communication infrastructure will be evaluated.
Under examination is the capability to provide Voice over IP (VoIP) communication subsequent to a disaster using SOSEWIN to compensate the degradation or break down of public domain communication systems. In addition, the transmission of compressed video signal or single image frames for surveillance of critical infrastructure to get fast damage estimation, will be examined. The integration of intelligent object detection, object tracing, the recognition of “critical” situations combined with the extraction of feature information could significantly reduce the transferred data. Like video sensors, other sensors, e.g. environmental dust monitors, and actors will be integrated. Alternatively to the remote access using mobile computers, the possibility to use smartphones and tablet devices running Android or iOS will be evaluated. These devices can manage the sensor nodes and display various sensor data.
The performance of these services in a self-organizing wireless mesh network has to be evaluated and if necessary they has to be adapted to the special communication infrastructure. The reliability of models for predicting the performance of these services is a very interesting research topic, too. For the realisation a testbed with over one hundred nodes will be installed in Berlin-Adlershof (called the Humboldt Wireless Lab HWL), consisting of combined in- and outdoor nodes with versatile sensor equipment. This reference system will provide an infrastructure to integrate, test and evaluate services for SOSEWIN, but in general it will be a laboratory for sensor equipped wireless networks.
The measured performance-values will be used to refine and calibrate simulation and environment models developed for the SOSEWIN development platform. This enhances the reliability of simulation experiments using the SOSEWIN model based development approach for distributed and cooperative sensor data analysis protocols.
Here we present several approaches for extended SOSEWIN-services and the perspective for larger network topologies using the results of HWL. We also present the approach of a powerful and mobile prototype of a tablet based management platform for wireless sensor networks.