

2nd Danube eRegion Conference – DeRC 2012

Grand Hotel Union Ljubljana, Slovenia

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<http://eLivingLab.org/CrossBordereRegion/DeRC2012>

Cross-border eSolution/eService Prototype Development

Prototype title: Geographical Information Processing for Environmental Pollution-Related Security within Urban Scale Environments

Short description of the prototype (problem to be solved, expected benefits, main stakeholders, expansion opportunities, related EU projects, references):

The GEPSUS project is focused on the catastrophes caused by uncontrolled emission of air pollutants, industrial objects, traffic, forest fires and explosions. By the application of mathematics, chemistry and physics, the simulator will be developed, which will visualize scenarios of possible catastrophic events.

It aims to support crisis managers and decision makers to access a wide range of geographical information and simulation results in real time to better deploy the most appropriate countermeasures. This is necessary in order to estimate the effect on the social level and for this reason GEPSUS will also provide access, distribution and processing of information related to the entire territory such as population and traffic distribution, energy consumption, together with a wide range of relevant geographical information.

The result (an online simulator) is also intended for the training of personnel (lower exposition of risk during a crisis, proper responses in critical situations).

Further, GEPSUS would improve environmental security by developing an integrated IT system to monitor and manage environmental information and to simulate the effects of the spread of pollutants at urban scale. Besides providing simulation of the effects of the distribution of air pollutants within an urban environment, GEPSUS will be developed to identify issues at the micro-scale level and specifically within urban environments in order to be able to manage and predict in time emerging patterns and their effect on the population.

Škraba, A, Stojanović, R, de Amicis, R, BERKOWICZ, S M., Conti, G, Elhanani, D, Lekić, N, Dragović, M, Kofjač, D. Integrating air-pollution dispersion simulation models and GIS for urban air-pollution emergency management : Elektronski vir. V: BREITENECKER, Felix (ur.), TROCH, Inge (ur.). 7th Vienna Conference on Mathematical Modelling, February 15-17, 2012, Vienna University of Technology, Austria. MATHMOD Vienna 2012 : full paper preprint volume, (ARGESIM Report, no. S38). Vienna: ARGESIM, cop. 2012.

Stojanović, R., Škraba, A., Lekic, N., de Amicis, R., Conti, G., Elhanani, D. (2011). Development of Simulation System for Air-Pollution Emergency Management. In In proceeding of IEEE Conference on Communication, Science & Information Engineering CCSIE2011. London, UK.

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<http://www.graphitech.it/gepsus>

ICT requirements for the prototype deployment:

3D geographic information available on the territory on a vast scale through the use of early warning sensor technologies to create simulations used to predict consequences of pollutant agents according to factors such as aeration conditions, temperature and moisture conditions etc.
The main challenge is to develop a system which can take into account changes in aeration conditions, in midlevel and microclimate. Further GEPSUS will investigate the influence of three dimensional modelling of urban layout on aeration conditions of an area, on midlevel and microclimate level.

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