FHNW, Institute of Geomatics Engineering

by Susanne Bleisch

Portrait

The Institute of Geomatics Engineering (IVGI) at FHNW University of Applied Sciences and Arts Northwestern Switzerland fulfils mandates in four categories – application-oriented research and development, academic education, further education and services. The Institute offers a Bachelor of Science in Geomatics and a Master of Science in Engineering with specialisation in Geomatics. Its key strength is the coverage of the whole Geomatics process chain from data capture (figure 1), modelling, and analysis through to visualizations. Traditionally, the focus was mainly on Geodetic Metrology, Photogrammetry and Geographic Information Science. With the redesign and extension of the BSc curricula in 2013 Cartography and Geovisualization have been introduced as additional focus areas. Consequently a new Professor in Geovisualization and Visual Analytics was appointed in 2014. Research at the Institute is application-oriented and generally co-financed by industry partners. This ensures a direct translation and implementation of research results and scientific knowledge into products and services. These close collaborations with industry are also employed for teaching by offering student projects within applied research and development activities both on Bachelor and Master level.

Research

Three focus areas of research and development at the Institute of Geomatics Engineering IVGI are portrayed through the images and additional details as follows. The IVGI has a strong reputation for innovative research in 3D geoinformation technologies. While the OpenWebGlobe project (www.openwebglobe.org) is well known, the recent Augmented Reality Technologies project GeoAR researches different AR and Geovisualization technologies (figure 2). It aims to develop new ways of portraying various sets of geodata on mobile devices and thus offering additional benefits compared to more traditional maps. The challenges included image-based indoor navigation and orientation, the optimisation of 3D interaction on touch-

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Figure 1: Student project in data capture – scanning archeological objects

Figure 2: Prototype of a mobile Augmented Reality Application for the extension of traditional paper maps

based user interfaces as well as improved (geo)information communication, for example through gaming applications, or the integration of real-time information.

Another primary field of research is the integration, analysis and visualization of volunteered geographic information. Often this is facilitated through the development of mobile applications for areas as diverse as noise level measurements (figure 3), crisis mapping, analysing zoo visitor and bike messenger trajectories, or educating school kids in collecting data and letting them analyse their use of spaces and places.

In a range of projects collaboration is not limited to industry partners but research is done with other institutes of the FHNW. One project analysed all alpine lakes in Switzerland and assessed their potential for small-scale hydroelectric power generation and communicated the results through maps. Another project used visual data mining techniques to evaluate the influence of different social factors of a range of settlement structures to improve future city building projects and communicated the results through a range of thematic maps (figure 4).

Figure 3: Poster advertising secondary school modules for noise data collection and the analysis of noise poll

50th Anniversary of the Institute of Geomatics Engineering at FHNW

In 2013 the Institute of Geomatics Engineering celebrated its 50th anniversary with a range of events for the students, the alumni and the public. The first students started their studies in the surveying institute of the newly established "Technikum beider Basel" in 1963. That was the start of the surveying engineering education in the area of Basel.

From Surveying to Geoinformation

The emphases with regards to contents of the studies have shifted considerably since the start. While at the beginning the courses were focused on surveying, nowadays students study the whole process from data capture, management to analysis of geographic information. Since 1998 research, especially in the field of 3D geoinformation technologies, has gained importance. A current impression of the studies at IVGI can be found at www.youtube.com/watch?v=foHUk1_RJH4

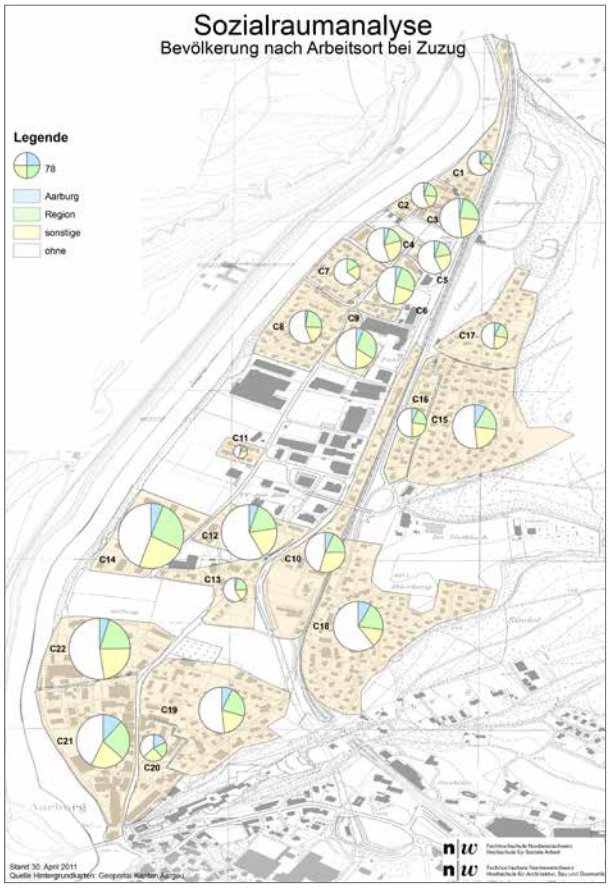

Figure 4: Exemplary thematic map for settlement analysis of Aarburg-Nord based on a range of social factors