University of Zurich UZH

Department of Informatics

University of Zürich
Department of Informatics
Binzmühlestr. 14
CH-8050 Zürich
Phone. +41 44 635 43 11
Fax +41 44 635 68 09
www.ifi.uzh.ch/dbtg

UZH, Dept. of Informatics, Binzmühlestr. 14, CH-8050 Zürich

Mirjam Müller

Prof. Dr. Michael Böhlen
Professor
Phone +41 44 635 43 33
Fax +41 44 635 68 09
boehlen@ifi.uzh.ch

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Topic: Visualization of the Animal Density in the Swiss Feed Database

There is strong evidence for regional influences on hay quality which are explained by altitude, botanical composition, production intensity and fertilizer intensity. In forage production including hay, the level of available fertilizer in the form of manure is directly linked with animal density. It is expected that high animal density results in high phosphorous content. The interesting questions are: How can we visualize animal density and hay quality simultaneously? How we can visually detect correlation between nutrients and animal density? How are hay samples distributed over the different animal density classes?

In the Swiss Database the animal density is available on a communal(gemeinde) basis. We use the PostGis, a spatial database extender for PostgreSQL relational database, to represent each gemeinde with a polygon. The PostGis enriches SQL with various operations on polygons: computation of the area, central point, intersection and etc. Within online application of the Swiss Feed Database, the spatial data is visualized using Google Maps API. Currently, two types of visualization are possible: each sample is denoted by a flag on the map and color plots visualize the containment of the selected nutrient across Switzerland.

The goal of this project is to extend the online Swiss Database with the visualization of polygons, where each polygon encloses one or a group of adjacent gemeinde and is colored according to the animal density within the enclosed area. The crucial aspect of this work is to experimentally determine the grouping of the gemeide that ensures fast performance and, at the same time, is sufficiently informative. The deliverables of the project are:

1. Visualization of the animal density in on-line web application using polygons;

2. Report of 10-15 pages;

The list of the literature is:

1. PostGIS References, 2013: http://postgis.net/docs/manual-1.3/ch06.html

2. Dalluege, U. 2006: PostGis Tutorial (Grundlagen). HCU Hamburg Dept. Geomatik

3. GISTutor: http://www.gistutor.com/postgresqlpostgis/4/18-importing-shapefile- gis-data-into-postgresql.html

4. Google Maps API, https://developers.google.com/maps/

5. Php, http://php.net/manual/en/index.php

Supervisor:

- Andrej Taliun

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Department of Informatics, University of Zurich

Prof. Dr. Michael Böhlen