Atlas of Switzerland goes online and 3D

Concept, Architecture and Visualization

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3D Visualization in Digital Maps and Atlases

- 3D in Cartography
3D Visualization in the Atlas of Switzerland

- 1995  First ideas for visualizing terrain in 3D
- 2000  Atlas of Switzerland – interactive
3D Visualization in the Atlas of Switzerland

- 2004 / 2010  Thematic 3D maps in the Atlas of Switzerland, versions 2 and 3
New Atlas of Switzerland

- Web-based Desktop version
  AoS – online

- 3D Cartography
  2D maps as a special case of 3D maps

- Virtual Globe

- Atlas as an Emotional Experience
  Visualize & Explore
New Atlas of Switzerland

- **Content**
  - Selective list of themes
  - Popular issues (e.g. national records)
  - New presentation of themes (3D)

- **10 Thematic Categories**
  - Portrait of Switzerland
  - History & Future
  - Nature & Environment
  - Landscape & Space
  - Tourism & Leisure time
  - Society & Culture
  - State & Politics
  - Economy & Energy
  - Traffic & Communication
  - Switzerland International
APS Data Workflow

- Acquisition
  Geometries, Attributes, Metadata, Multimedia elements
  AdS Converter (for AdS3 Data)

- Editing
  Quantum GIS with APS-Editor

- Storing
  Tiling as TFSB and TMS
  PostGIS Database
  Mongo-DB
APS Globe: Virtual Globe «osgEarth»

- Implemented in C++; based on OpenSceneGraph (OSG)
- LGPL OpenSource Licence (OSG and osgEarth)

**Functions**

- Rendering and navigation in near real-time
- User-defined terrain models
- Raster images / Vector data / 3D objects
- Labeling, etc.
APS Globe: Virtual Globe «osgEarth»

- Complex techniques
- New application area: 3D Cartography

Drape Mode: Overlay Resolution Ratio = 0
Drape Mode: Overlay Resolution Ratio = 5
Atlas GUI

In the image, the Atlas GUI of ATLAS DER SCHWEIZ is displayed. The page features a search bar, categories selection, and various data visualizations. One of the visualizations is titled "Treibhausgase: Emissionen nach Sektor," which translates to "Greenhouse gases: Emissions by sector," indicating a focus on environmental data, specifically emissions by sector. Another visualization is labeled "Linienflüge: Anzahl transportierte Passagiere auf internationalen Flugstrecken," meaning "航线: 运输的乘客数量，国际航线，" which translates to "Air Routes: Number of transported passengers on international flight routes." These visualizations suggest that the Atlas GUI is a tool for exploring and analyzing different types of data, such as environmental and transportation data, in Switzerland.
Atlas Platform Switzerland (APS)

Front-end

- APS GUI: HTML, JavaScript, CSS
- APS Globe: Chromium Embedded Framework, osgEarth

Back-end

- APS Server: nginx, haproxy
- APS Tiles & Files: TMS, TFSB, JSON
- APS Database: PostGIS, MongoDB
- APS Editor: QGIS
3D Visualizations

Point Features

- Technique: Extrusion
- Base map
  Hydrography, Relief
3D Visualizations

Point Features

- **Technique: Translation**

- **Base map**
  National borders

Number of inhabitants per commune as point cloud map
3D Visualizations

Point Features

- Technique: Billboard
- Base map
  Aerial/Satellite image, DHM25

Mountain huts as symbols
3D Visualizations

Point Features

- Technique: Billboard
- Base map
  Color-coded Relief, Borders

Electricity consumption as ring charts
3D Visualizations

Point Features

- Technique: 3D Diagrams

- Base map
  Color-coded Relief

Population development as pyramid frustums
# 3D Visualizations

## Line Features

- **Technique: Trajectories**
- **Base map**
  - Aerial/Satellite image, Airports

![Direct flights departing from Zurich as lines](image_url)
3D Visualizations

Area Features

- Technique: Extrusion
- Base map
  Aerial image / National map, DHM25

Settlement areas and buildings as polygons [MPA P. Inauen 2013]
3D Visualizations

Volume Features

- Technique: terrain model
- Base map
  LGM Rivers and lakes, LGM-DHM25

Last Glacier Maximum LGM as raster
AoS Tasks 2015/16

- Base maps, Thematic layers, Translations
- GUI, APS Globe
  Print; Measure; WMS/GPX; Navigation
- Alpha-Version
  Usability Tests
- Beta-Version
  Functionality and Stability Tests

Future Work

- Cartographic symbolization
- LOD structure; Zooming
- Generic 3D objects
- Tools for 3D
- Animations, Story telling ...
- OSX version, Tablet versions

Atlas of Switzerland – online
Release 1.0 for WINDOWS
Time for Questions ...

... or Mail to: atlasinfo@ethz.ch