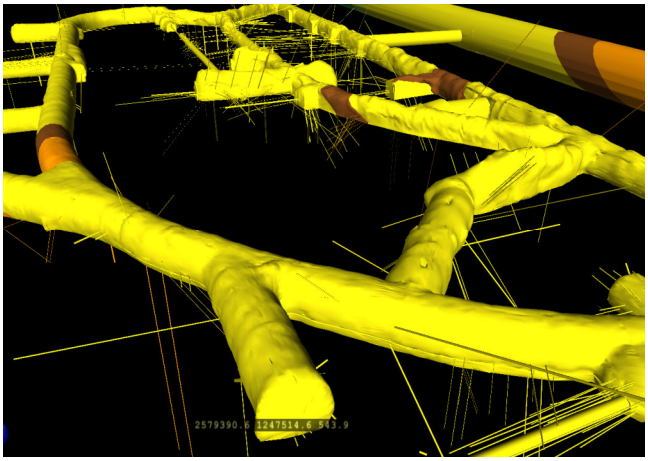
Borehole information system

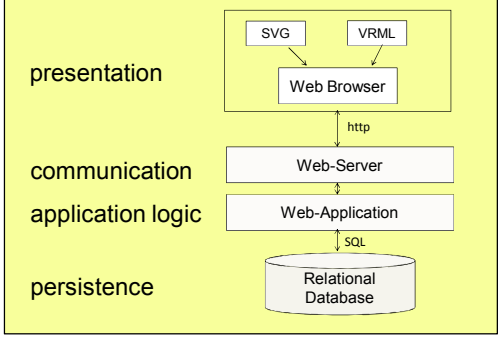
3D-Visualization of the Mont Terri Laboratory

Situation

The Mont Terri rock laboratory is situated in the Opalinus clay unit at the Jura mountains. The laboratory is operated by swisstopo. More than 1000 boreholes were drilled by the 15 project partners for performing experiments in Opalinus clay. This very tight clay is a candidate host rock for radioactive waste repositories.



Application Architecture



Description

The system visualizes the boreholes drilled at the Mont Terri Laboratory together with the tunnels and niches. Boreholes can be filtered and the associated information will be shown. Some geometrical functions are available to calculate distances and intersections.

Add a New Borehole

DB Mngmt & Planning © New Borehole

boreholesid		
galleryid	SG	Edit
eaststart		[m]
northstart		[m]
altitudestart		[m]
azimuth		[degree]
dip		[degree]
eastend		[m]
northend		[m]
altitudeend		[m]
niche		
tunnelmeter		[m]
levels		
collar		[time]
completion		
logging		
history		
sampling		
survey		
loggingdate		
surveydate		
photolink		Edit
mappinglink		Edit
samplinglink		Edit
logginglink		Edit
overcoredborehole		
phaseid	17	Edit
prolongation		[cm]

Add

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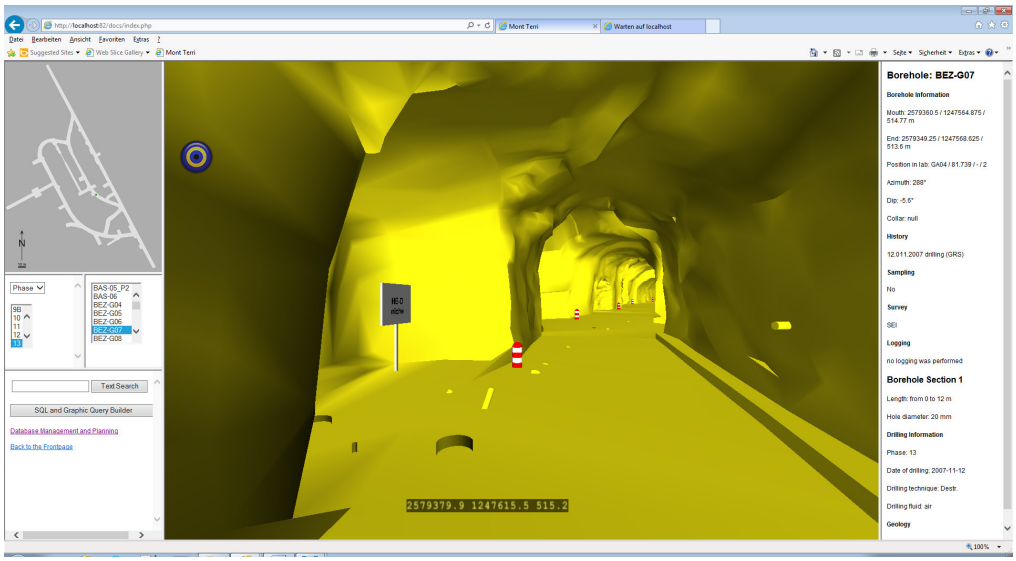

Technologies

Database: PostgreSQL
Communication layer: Apache, PHP
GUI: HTML, JavaScript, WebGL (three.js)

Geometric Functions

DB Mngmt & Planning © Geo. Functions

1) Task

- (•) Calculate the Shortest Distance between Boreholes
- ( ) Calculate the Intersection with Tunnels

2) Reference borehole

(•) A New Borehole

Start coordinates are required.

Either end coordinates or Azimuth+dip+length is necessary.

Start X:	Start Y:	Start Z:
End X:	End Y:	End Z:
Azimuth:	Dip:	Length:

( ) An Existing Borehole — BoreholeID

3) Targted boreholes

3-1) Options to select boreholes

I) Add Borehole by ID	Add
II) Text Search	Add
III) Graphic Query Builder	Open
IV) Add All Boreholes	Add

3-2) Borehole List

MontTerri Boreholes

DB Mngmt & Planning © Opt. Select Boreholes © MtTerri Boreholes

#	altitudeend	altitudestart	azimuth	boreholesid	dip	drillingnr	username
1	517.23	517.23	72	BAS-01	0	511	swisstopo
2	517.86	517.136	72	BAS-02	5	512	swisstopo
3	517.214	517.883	72	BAS-02_OC	5	513	swisstopo
4	517.38	517.96	72	BAS-02_P	5	600	swisstopo
5	517.335	518.038	72	BAS-02_P_OC	5	601	swisstopo
6	517.72	516.79	68	BAS-03	4.4	602	swisstopo
7	517.225	517.255	68	BAS-03_OC	4.4	603	swisstopo
8	520.853	518.193	92	BAS-04	12.7	664	swisstopo
9	519.823	517.537	92	BAS-05	12.7	665	swisstopo
10	522.8	519.8	72	BAS-05_P2	15	743	swisstopo
11	519.878	517.587	72	BAS-06	15	707	swisstopo
12		516.387	150	BBB-1	45	789	swisstopo
13		515.88	242	BBB-2	0	790	swisstopo
14		516.126	150	BBB-3	45	856	swisstopo
15		516.126	150	BBB-3_R	45	937	swisstopo
16	493.77	513.69	0	BBF-1	-90	1	swisstopo
17	493.49	513.72	0	BBF-2	-90	2	swisstopo
18	493.57	513.75	0	BBF-3	-90	3	swisstopo
19	493.79	513.79	0	BBF-4	-90	4	swisstopo
20		512.108	0	BBN-1	-90	843	swisstopo
21		513.748	314	BBW-1	-47	871	swisstopo
22		515.617	134	BBW-2	47	880	swisstopo
23		514.286	334	BCD-1	48	838	swisstopo
24		514.286	334	BCD-1_OC	48	850	swisstopo

Graphical User Interface

Panels

The graphical user interface consists of a 3D-view, a map view, a search panel and an information panel. If a borehole is selected, it is shown in all panels immediately.

Geometric functions

For planning new boreholes, the distance between boreholes and intersection point with the tunnel wall can be calculated

Editing

New boreholes can be edited in a form and documents can be uploaded and assigned to a borehole.

A first version of the tool was developed by Martin Heller at Colenco.

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