GJOVIK UNIVERSITY COLLEGE

IMT4951 APPLIED DIGITAL WORKFLOW

THE PROJECT REPORT

Displaying of grocery stores and cafes on a digital map

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1 PLANNING

1.1 Problem statement, research questions, methods and means

1.1.1 A main problem

Gjovik[1] is wonderful city of Norway, is located just 1,5 hours north of Oslo and only 30 minutes from Lillehammer on the west side of Lake Mjsa. It perfectly combines the urban and rural culture and architecture - an exciting, dynamic noise of the city and the peace and tranquility in the country harmoniously. All these Gjvik attract attention of tourists of all ages and nationalities. Also in Gjovik there are University College[2], where many foreign students learn, and development infrastructure of the cite promotes to the conferences.

And as often happens in the new place, we do not know where to go to take a meal, how eating places and grocery store works and what they offer. People need a digital map where the coordinates of the grocery stores and public eating places of the city will be displayed with a description and time of working.

1.1.2 Goal of the project

The purpose of writing the project will be a open source solution that automates KML[3]-generation based on geotagged files with embedded metadata. Metadata[4] will include the name of the object, mode of operation and a brief description. For clarity of the project, each object will be equipped with a photo. For public use the KML-files will be uploaded in http://www.stud.hig.no. Also Geo Sitemap [5] file will be created in uploaded in here and submited to Google[6].

1.1.3 Methods and tools

While working on the project I plan to use the following methods:

- studies literature and open source solution;
- collecting data;
- description data;
- programming;
- testing;
- writing report.

While working on the project I plan to use the following tools:

- camera with GPS;
- open source software;
- Unix shell;
- Web-services Google Maps.

1.1.4 The end result

The result of the project will a correct working bash shell-script[7] that is based on open source OS and software and will be accompanied by documentation and rules of use.

1.2 Project plan

Project plan - Applied Digital Workflow
Last revision: 04.11.09
Project manager: Vera Nekrasova

Milestones	Activities	Person	Resources	Risk	43	44	45	46	47	48	49	Total hour
1.Proposal plan	a)Studies literature	Vera N.	l,s	mf	*							3
	b)Studies OS solutions	Vera N.	l,s	mf	*							3
	c)Writing a pre-project plan	Vera N.	l,s	mf		*	*					4
2.Implementation	a)Collection data	Vera N.	CwG	mf				*				8
				bw				*				
	b)Description data	Vera N.	l,s	mf				*				2
	c)Transform data	Vera N.	l,s	mf				*				3
	d)Move data	Vera N.	l,s	mf				*				1
	e)Presenring using Mashup(KML)	Vera N.	l,s	mf					*			8
	f)Automation	Vera N.	l,s	mf						*		8
3.Final report	Writing a final report	Vera N.	l,s	mf							*	10
												50

l-laptop **s**-sowtware **CwG**-Camera with GPS **mf**-malfuctions **bw**-bad weather

1.3 Legal implications of the data

This project is carried out exclusively for educational purposes, and may be used later in a match with the license CC-BY-NC[8], i.e. with the condition of attribution and non commercial.

2 IMPLEMENTATION

2.1 Collect

Data collection for the implementation of this project is taking a photo of grocery stores and cafes using a camera with a GPS device.

I used smartphone the Nokia 5800[9] to collect information. Due to the fact that this smartphone has a built-in GPS receiver and 3.2 megapixels camera with Carl-Zeiss optics and autofocus.

The follow places were took a photo, it was a grocery stores and cafes located in the center of the city, such as:

- Bructbua Cafe;
- Cafeteria in HiG;
- CATERING and Kafe;
- CC Mart'n (This is a shop center that has a grocery store and many cafes.)
- Chaplin Cafe;
- EGON;
- Fast and Tasty;
- Cafeteria in Fjellhallen;
- Gjvik sjokoladefabrik;
- Kaffka Cafe;
- KIWI mini pris;
- New Hong Kong Restaurant;
- Lasse Liten;
- Peppes Pizza;
- REMA 1000;
- RIMI;
- ICA;
- and many other.

2.2 Describe

The program Exiftool[10] was used to describe the photographs. I added pictures to the following tags:

- Location address;
- Description work time;
- Comment description and characterization of place;
- Artist by photographs;
- Type grocery store or cefe;
- Copyright information about copyright. Type CC-BY-NC were selected consistent with the Creative Commons.

Also file name was changed in the tag *-File Name* from the standard of the camera at the appropriate place.

2.3 Transform

The program ImageMagick[11] was used for the transformation of the photos. With the command:

`for image in *.jpg; do convert -resize` $x300$ `‘‘$image’’ ‘‘_thumbs/${image%}’’; done`

photo was resized.

2.4 Automation

Automation the process of creating KML files based on existing images is performed using a BASH script. Bash is a free software Unix shell written for the GNU Project.

Automation is that eliminates the need manually add each point in the KML, thanks to the script data using the program is read from corresponding tags of Exiftool and added KML file. With this script any number of photos can be handle. My bash-script consist of the follow parts:

1. Creation of KML file On this part KML file is declared, styles of displaying of placemarks are ordered.
2. Inserting of point with coordinates On this part type of point is defined (*Grocery* or *Cafe*) and style of placemark is settled. Also using the program Exiftool data of point is read from tags. I read such data us *GPSLongitude; -GPSLatitude; -FileName; -Location; -Comment; -Artist.*
3. Finishing of KML file.
4. Creation of KMZ files using a program `‘‘zip’’`[12]. KMZ files consist of all photos and KML file.

2.5 Move

For universal use the resulting KMZ file was uploaded to www.stud.hig.no/ 091311/ using a program `‘‘scp’’` [13]. Command: `scp *.* 091310@loke.hig.no:public_html`.

2.6 Presenting using Mashup (KML)

Opening KMZ file on the site Google Maps user can see the location of grocery stores and cafes on the map. When click on the desired point user will be provided information about the point: the address, time, brief description and photograph.

The user can disable such as grocery store, and then displayed on the map only cafes or do the opposite.

3 END PRODUCT

The final product of working on the project is the bash-script to automatically generate KML/KMZ file for display on the map of grocery stores and cafes.

A code of bash-script is presented below.

```
#! /bin/bash

a="Cafe"
b="Grocery"

echo '<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2"
xmlns:gx="http://www.google.com/kml/ext/2.2"
xmlns:kml="http://www.opengis.net/kml/2.2"
xmlns:atom="http://www.w3.org/2005/Atom">
<Document>
        <name>Grocery stores and cafes</name>
        <open>1</open>
        <description>
                Grocery stores and cafes  display in Google Earth.
        </description>
        <StyleMap id="msn_grocery">
                <Pair>
                        <key>normal</key>
                        <styleUrl>#sn_grocery</styleUrl>
                </Pair>
                <Pair>
                        <key>highlight</key>
                        <styleUrl>#sh_grocery</styleUrl>
                </Pair>
        </StyleMap>
        <Style id="sn_grocery">
                <IconStyle>
                        <scale>1.2</scale>
                        <Icon>
                                <href>
http://maps.google.com/mapfiles/kml/shapes/grocery.png</href>
                        </Icon>
                        <hotSpot x="0.5" y="0" xunits="fraction"
yunits="fraction"/>
                        </IconStyle>
                <ListStyle></ListStyle>
        </Style>
        <Style id="sh_grocery">
                <IconStyle>
                        <scale>1.4</scale>
                        <Icon>
                                <href>
http://maps.google.com/mapfiles/kml/shapes/grocery.png</href>
```

```
                        </Icon>
                        <hotSpot x="0.5" y="0" xunits="fraction"
 yunits="fraction"/>
                </IconStyle>
                <ListStyle></ListStyle>
        </Style>
        <Style id="sn_dining">
                <IconStyle>
                        <scale>1.2</scale>
                        <Icon>
                                <href>
http://maps.google.com/mapfiles/kml/shapes/dining.png</href>
                        </Icon>
                        <hotSpot x="0.5" y="0" xunits="fraction"
yunits="fraction"/>
                </IconStyle>
                <ListStyle></ListStyle>
        </Style>
        <Style id="sh_dining">
                <IconStyle>
                        <scale>1.4</scale>
                        <Icon>
                                <href>
http://maps.google.com/mapfiles/kml/shapes/dining.png</href>
                        </Icon>
                        <hotSpot x="0.5" y="0" xunits="fraction"

 yunits="fraction"/>
                </IconStyle>
                <ListStyle></ListStyle>
        </Style>
        <StyleMap id="msn_dining">
                <Pair>
                        <key>normal</key>
                        <styleUrl>#sn_dining</styleUrl>
                </Pair>
                <Pair>
                        <key>highlight</key>
                        <styleUrl>#sh_dining</styleUrl>
                </Pair>
        </StyleMap>
        <Folder>
                <name>places</name>
                <open>1</open>
                <Folder>
                <name>Groceres</name>
                <open>1</open>' > Places.kml |

for image in *.jpg
```

```
do

longitude=`exiftool -GPSLongitude -n  -S -S $image`
latitude=`exiftool -GPSLatitude -n -S -S $image`
description=`exiftool -Description -S -S $image`
nameOfPlaces=`exiftool -City -S -S $image`
name=`exiftool -FileName -S -S $image`
location=`exiftool -Location -S -S $image`
comment=`exiftool -Comment -S -S $image`
type=`exiftool -Type -S -S $image`
artist=`exiftool -Artist -S -S $image`

if [ "$type" = "$b" ];
then
echo "<Placemark>
        <name>$nameOfPlaces</name>
        <description>
        <![CDATA[
            <p align=left><strong>Schedules:</strong> $description</p>
            <p align=left><strong>Adress: </strong>$location</p>
            <p align=justify><em>$comment</em></p>
            <img src="$name">
            <p align=left>By $artist</p>
        ]]>
        </description>
        <styleUrl>#msn_grocery</styleUrl>
        <Point>
            <coordinates>$longitude,$latitude</coordinates>
        </Point>
</Placemark>"  >> Places.kml |

fi
wait
done

echo " </Folder>
  <Folder>
  <name>Cafe</name>
  <open>1</open>" >> Places.kml |

for image in *.jpg
do

longitude=`exiftool -GPSLongitude -n  -S -S $image`
latitude=`exiftool -GPSLatitude -n -S -S $image`
description=`exiftool -Description -S -S $image`
nameOfPlaces=`exiftool -City -S -S $image`
name=`exiftool -FileName -S -S $image`
location=`exiftool -Location -S -S $image`
```

```
comment=`exiftool -Comment -S -S $image`
type=`exiftool -Type -S -S $image`
artist=`exiftool -Artist -S -S $image`

if [ "$type" = "$a" ];
then
echo "<Placemark>
        <name>$nameOfPlaces</name>
        <description>
        <![CDATA[
            <p align=left><strong>Schedules:</strong> $description</p>
            <p align=left><strong>Adress: </strong>$location</p>
            <p align=justify><em>$comment</em></p>
            <img src="$name">
            <p align=left>By $artist</p>

        ]]>
        </description>
        <styleUrl>#msn_dining</styleUrl>
        <Point>
            <coordinates>$longitude,$latitude</coordinates>
        </Point>
</Placemark>"  >> Places.kml |

fi
wait
done

echo " </Folder>
</Folder>
</Document>
</kml>" >> Places.kml

zip Places.kmz *.jpg *.kml
exit
```

To run this script requires photos which should contain the following EXIF-information:

- Mandatory: GPSLongitude; GPSLatitude;
- Optional: FileName; Location; Comment; Artist.

Photos should be stored in the same folder as the script.

4 CONCLUSION

The result of the project is a correct working bash shell-script that is based on open source OS and software. Bash-script allows to automatically generate KML/KMZ file for display on the map of grocery stores and cafes.

Lack of work is that the Geo Sitemap file was not created and submited to Google. But it can be a future work and enable more users to learn about location of grocery stores and cafes in Gjovik.

References

[1] http://en.wikipedia.org/wiki/Gjovik

[2] http://www.hig.no/

[3] http://code.google.com/apis/kml/documentation/kml_tut.html

[4] http://en.wikipedia.org/wiki/Metadata

[5] http://www.google.com/support/webmasters/bin/answer.py?hl=enanswer=94554

[6] http://maps.google.com

[7] http://en.wikipedia.org/wiki/Bash

[8] http://en.wikipedia.org/wiki/Creative_Commons

[9] http://www.gsmarena.com/nokia_5800_xpressmusic-2537.php

[10] http://www.sno.phy.queensu.ca/ phil/exiftool/

[11] http://www.imagemagick.org/script/index.php

[12] http://en.wikipedia.org/wiki/ZIP_(file_format)

[13] http://en.wikipedia.org/wiki/Secure_copy"