Green Move Web Viewer: critical issues and implementation

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The **Green Move** project is a sustainable mobility project of Politecnico di Milano with the support of Regione Lombardia: it is an innovative service to share vehicles

- http://www.greenmove.polimi.it
the Green Move project

✔ Geomatics Labs main targets:

➢ design and development of a cartographic viewer
➢ design and implementation of a data sharing system
➢ supporting monitoring activities
✓ Vehicles can send continuously data
  ➢ position data from GPS
  ➢ battery level charge
  ➢ and many other...
Main aspect:

INTEROPERABILITY

Through:

ADOPTION OF COMMUNICATIONS STANDARD
The Open Geospatial Consortium (OGC) is an international consortium with more than 400 members (companies, government agencies and universities)
- http://www.opengeospatial.org/

The goal is to develop **standard interfaces** to support interoperable solutions that "geo-enable" the Web
- OCG Web Services (OWS)
system architecture

- client OWS
- browser
- webGIS
- webserver
- cartography
- OWS server
- DB
OWS standards used

✔ OGC Web Services (OWS)

➢ currently operational services:
  - Web Feature Service (WFS)
  - Web Map Service (WMS)

➢ operational soon
  - Sensor Observation Service (SOS)
  - Web Processing Service (WPS)
software used

✔ **PostGIS** - http://www.postgis.org

- Geographic data support
  - POINT, linestring, polygon, multipoint, multilinestring, multipolygon, geometrycollection

- Geographic data operators

- Importation tools from various data format

- Permit direct access to data from GIS software

✔ **MapServer** - http://www.mapserver.org/

✔ **OpenLayers** - http://www.openlayers.org/
**Coordinates System**

**WGS84** - geographic coordinates system => EPSG:4326

**WGS84/UTM32N** - projected coordinates system => EPSG:32632

**WGS84 Pseudo-Mercator** - projected coord. syst. => EPSG:3857
OWS server

✔ desktop GIS
  • ex. QGIS
OWS server

- On-line web services
  - Portale Cartografico Nazionale
Connettività e sistemi di geolocalizzazione: utilizzo del server OWS
OWS server
webGIS
✓ link between car position and google street view

front and back view updated with car position

and street view navigation page
vehicle position correction

- test with real data
- GPS coordinate are a bit wrong
  - the vehicle position doesn't match always with a road

- It needs to define corrections tools
  - It needs have a road network
vehicle position correction

✔ Evaluate whether it needs a own network road
  ➢ acquisition and maintenance
  ➢ a better positioning algorithm
  ➢ path analysis
  ➢ ...

✔ Otherwise build the positioning algorithm with less constraints as possible
  ➢ only geometry
  ➢ no topology
  ➢ no directions info
OpenStreetMap (OSM) is a collaborative project to create a free editable map of the world. Data access is via web at http://www.openstreetmap.org/. Data can be also downloaded. There are four layers: osm_mi_line, osm_mi_point, osm_mi_polygons, and osm_mi_roads. Data is imported in PostgreSQL/PostGIS.
 ✓ Data evaluation process
✅ Line layer
✅ any type of path (road, railway, pedestrian way,... )
It needs to filter the line layer data

**osm_mi_strade**

all the elements that have set highway field with consistent value

- "discarded" values:
  - pedestrian, raceway, path, footway, cycleway, bridleway, steps, proposed, construction, escape;

http://wiki.openstreetmap.org/wiki/Map_Features
✓ It needs to filter the *line* layer data
✓ *osm_mi_strade*
vehicle position correction - 1

- search the nearest network link (within a distance range)

- there are errors at the crossroads
to improve the correction tool
evaluate:

- proximity to road link
- comparison between orientation road link and orientation car moving
GRAZIE!

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