Masters in Computer Vision – Vibot - MAIA
Software Engineering Project
2019-2020

1 – Introduction

The goal of this project is to develop a software to locate (and rate) various buildings, such as schools, university buildings, major offices, hospitals, various shops, cool restaurants, streets, roads, parcs, and other interesting points in Le Creusot.

The key idea is to develop a software to visualize le Creusot, its streets, some buildings, roads, and parcs, in which the user can perform several actions, such as asking for an itinerary between two (or passing through more) points, or ranking (or adding information) to a bar or a restaurant for example.

The software should be designed so that a newcomer to Le Creusot should use it to find useful information, such as :

- What is the shortest path to walk from the IUT to the Centre Universitaire Condorcet?
- Can you provide an itinerary that is at most 5km long, that passes by a bakery, that starts in Résidence Jean Moulin, and that ends in the Résidence Acacia?
- How can I walk from the Centre Universitaire Condorcet to a grocery store?
- I want to visit the Parc de la Verrerie...
- How much time does it take to drive from the train station to Condorcet?
- How many grocery stores are located within a 3km radius from Jean Moulin residence?
- Where is the post office? What are the best restaurants in Le Creusot? Where can I buy flowers?

2 – Project requirement and constraints

- Input /output files: the points of interest can be loaded/saved/modified by the user
- The result of a request should be displayed graphically within the software (using any strategy you deem valuable (Qt, OpenGL, OpenCV, etc.) and a text version should be exported in the format of your choice
- The user can select the beginning and the end of his itinerary directly from the screen, or by selecting appropriate items using any kind of menus/lists, depending on your windowing system and implementation
- At least, the following locations have to be available in your software
  - IUT and Condorcet (several buildings, library, lab, class rooms, etc)
  - **at least** 3 grocery stores, 5 restaurants, 3 fast food places, 3 bakeries
  - Cultural places, such as Parc de la verrerie, the theater, the concert room (ARC), and any other place you deem important
  - **at least 20** other shops (hair cut, sportwear, clothes)...
- Apart from the buildings, major roads and streets have to be present. The program

should distinguish if you can walk and/or drive. For instance, you cannot drive a car into the Parc de la Verrerie, but you can walk from IUT to Condorcet even if you follow a road...

- You can use google map to create some images offline to spare you some time, but your program must be usable offline : it **MUST NOT** send requests to google (or any other server) . In other words, you have to create your own map, not interface the existing one.

3 – Deliverables and Assessment

You should provide a functional software with a graphical user interface implemented in C++ under QT IDE. The deliverables include, at least, the following items:

- Complete source code + libraries + makefile and any help file to compile your program.
- Report in .pdf format, written using LaTeX
- Defense presentation, 20 min (.ppt, .odp, .pdf format) : Last week of december
- **All deliverables, except the defense prensentation, should be returned by Sunday December the 15th**

You will be assessed on the following items

- Report, no page limit
- Intermediate report(s) if any, and project management. (do not forget to link your github repository and trello board if you use any)
- Problem analysis: Critical choices of structures, classes, and their implementation
- Strategy for building the user requests and their interpretation
- Path computation algorithms
- User interface. Easiness of use (menus, mouse clicks, various options, etc)
- Visualisation
- Powerpoint Presentation of your work (end of semester) and demo
- Originality and optional (but useful) work: if you think you can go further, do it. These options will be considered as bonuses in the final grade of your project

Ethics and advices

- If you use or adapt some source code from internet, mention it.
- Groups of **4 students** per project **at most**
- The list (cartography) of the required items can be done in collaboration with all the students
- To obtain the accurate locations of buildings and texture map, use google earth, see illustration next page.
- This project is ambitious and requires some deep reflection before coding
  - Take the time to prepare and sharpen your analysis.
  - Manage your time efficiently
  - Do not focus to much on specific details if something is not fully working
  - Do not wait the very last weeks to start working on your project
  - In case of problem, for any question regarding this project, or if you want to have some feedback on your project while working on it, do not hesitate to contact me at yohan.fougerolle@u-bourgogne.fr


Amphi C
Le Creusot
Avenue de l'Europe
Avenue Jean Monnet
Rue de l'Université
Rue Chaptal
Allée Pierre de Coubertin
Rue de Longwy
Rue de la Fonderie
D28
D984
Rue Jean Jaurès
Boulevard Saint-Quentin
Rue Marcel Sembat
Rue Jean Poux
Rue Clemenceau
Avenue de Verdun
Rue du 19 mars 1962
Rue Jean-Baptiste Dumay
Rue de Blanzy
Promenade du Midi
Place de l'Etang de la Forge
Rue de Montpellier
Rue de Melun
Rue de Mulhouse
Rue Malakoff
Rue de Puebla
Rue de Sébastopol
Rue de Solférino
R du Président Wilson
D1
Rue Saint-Eugène
Rue Bourdon
Rue Papin
Rue Colin
Rue d'Arcole
Rue Magenta
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Google
es satellite : 2007
46°48'27.25" N
4°25'26.33" E
Altitude 1.84 km