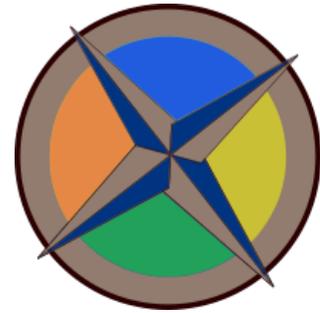


Mission Support System : Enhance KML Support



About Me

Name : Aryan Gupta

Time Zone : 05:30+ GMT

IRC/Slack Handle : Aryan Gupta

Github : <https://github.com/withoutwaxaryan>

Education & Background

I am currently a 2nd Year Student at Cluster Innovation Centre, University of Delhi (India), pursuing Bachelor of Technology degree in Information Technology and Mathematical Innovation. I expect to graduate in the year of 2022.

Cluster Innovation Centre : <https://ducic.ac.in/>

University of Delhi : <http://www.du.ac.in/>

I have worked with Python in the following ways :

- [Writing Small Fun Programs](#)
- [OpenCV Programs](#)

And programs that I wrote while following 'Automate the Boring Stuff with Python' by Al Sweigart.

Contributions to Mission Support System

Contribution	Issue Number	Pull Request
Remove Tools from MSS Main Menu and code	#476	#809
Display User/ System Configuration in Main GUI	#308	#802
Refactor logging format interpolation findings by pylint	#536	#795
Fixed Spelling Errors		#808

Project Details

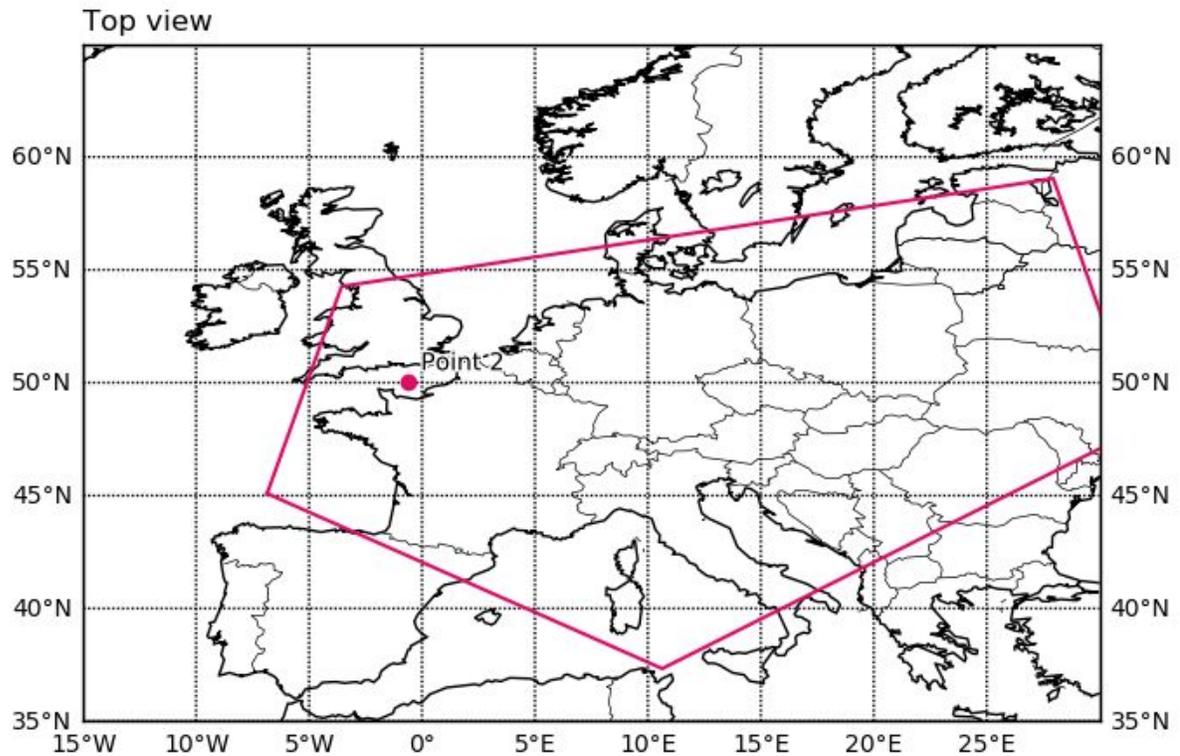
Sub-Org : Mission Support System (MSS)

Abstract: Keyhole Markup Language (KML) is an XML notation for expressing geographic annotation and visualization within two-dimensional maps and three-dimensional Earth browsers. The MSS software currently supports in a very crude manner the overlay of KML files on the shown maps to support flight planning.

In this project, I will redesign and implement a better UI to display multiple KML files simultaneously. I will also be focussing on enhancing useful features from KML specification and implementing them in the MSS frontend.

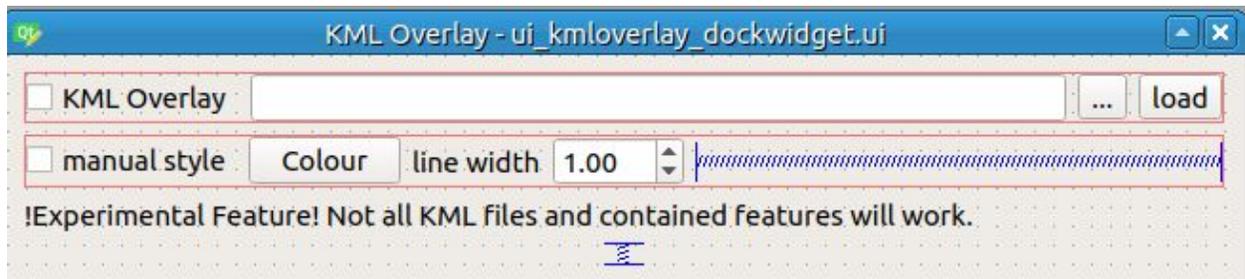
Detailed Description :

The current KML overlay widget solved several practical issues but has several shortcomings :



- The program only displays basic points and lines/polygons without any description about the placemarks and the area which they are bounding.
- All the points in KML are given the same colour and style i.e they are not customisable and difficult to interpret.

- The TopView has a KML Overlay Docking Widget that allows the visualization of KML files on top of the map.



Existing KML Overlay

The KML Overlay Widget only supports loading 1 KML file.

However, some regions on the map are inaccessible due to various reasons (missing flight permits, military restricted areas) etc. Some Users can upload their self generated maps. Therefore, while planning Flight Tracks, it's necessary to mark such areas. These can be provided by adding multiple KML files to the Flight Map.

Milestones

Project Goals :

1. Adding new features to KML Overlay
2. Updating UI for KML Overlay Dock Widget
3. Collection of KML Test Samples

1. Adding New Features to KML Overlay

I propose to introduce the following features :

1. Display Multiple KML Files

- Load local KML Files on a map simultaneously
- Display or Remove Individual KML Files from map
- Providing a Scale (During Zoom In and Out)
- Support to Load User Generated KML files (Google My Maps)

2. For Each KML File :

- Improved Placemarks - Customisable Pushpin/ Balloon Images
- Manual Customization (Color, Line Width) for each KML File (Placemarks, PolyRings, LineStyle , LabelStyle etc)
- Provide Additional Information about Placemark using Descriptive HTML tags to show Info Snippets, Links and actual places at the points ; to make the experience more enriching.

3. Adding External Map Images

- Implement a UI Option to load and store User Defined Map Images.This also includes Photo Overlays as well as Screen Overlays.
- Map to be loaded either from local files or the Internet.

4. Create New KML File Option

- After Overlaying several KML files together, option to merge and create a new KML File
- Validate the New KML File

5. Add Functionality to Redraw Option

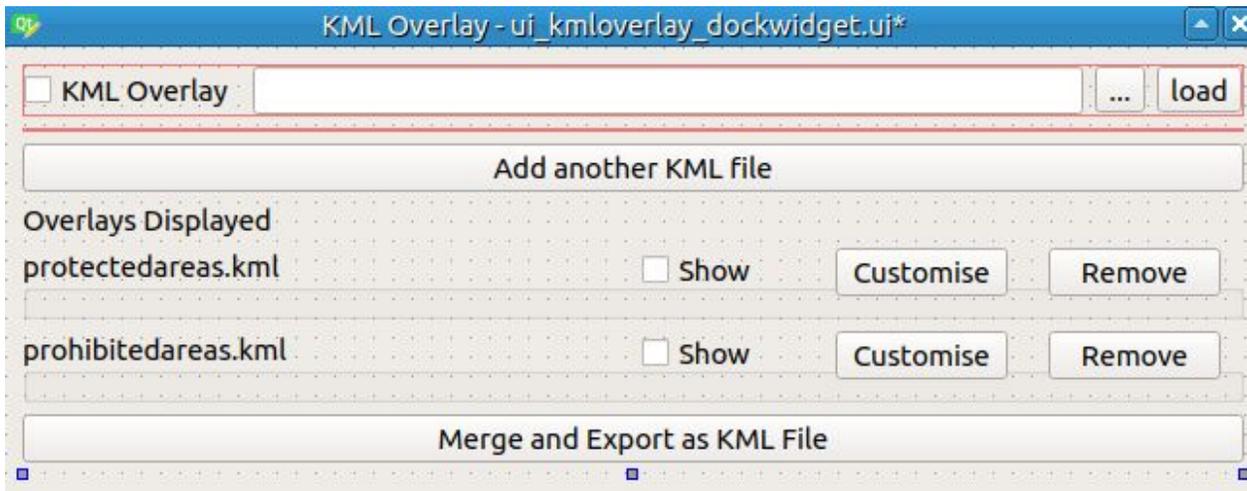
- Currently the Button is redundant. It should be able to load the original Flight Track without the KML Overlay.

6. Display recently loaded KML files in the Browse Area for convenience.

2. Updating UI for KML Overlay Dock Widget

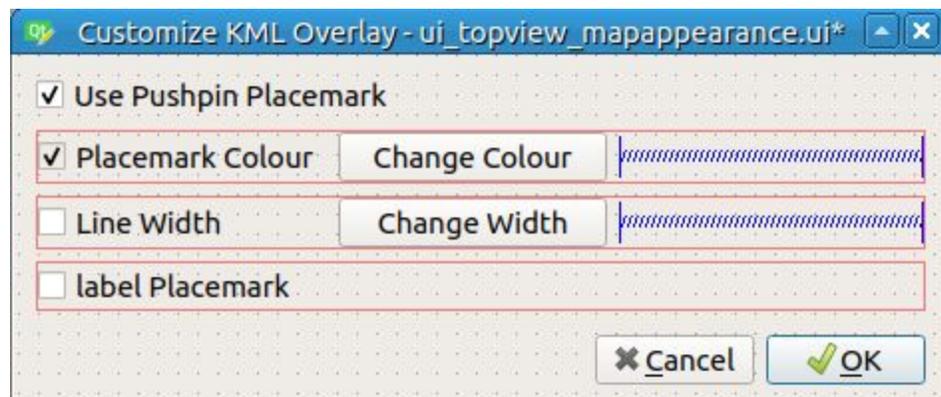
Depending on the features to be added, the UI needs to be revamped :

- a) KML Overlay Dock Widget : To add Feature of Displaying Multiple KML files



Proposed KML Overlay(Subject to change)

- b) Customise Option for Placemarks in Individual KML Files



Customisable Placemark Options for Each KML file (Subject to change)

3. Collection of KML Test Cases

I will collect a number of KML Test Cases to be added to kml samples which substantiate the usage of KML features added. All KML files will be added to the package(mentioned below) created for Samples.

Stretch Goals

Some Other Issues that I would like to work on :

1. Export and Save Active Flight Track as .kml file

Benefit : It opens up the possibility to load flight tracks *directly* in Google Earth and check details in respect to the flight.

Progress : A Plugin was developed for MSS 1.4.0. (mss/mslib/plugins/io/kml.py). However , It has not been tested and is inactive. I propose to activate it and add a UI element to use the feature.

2. Add Support for Fastkml

Fastkml is better than lxml, since it adds functionality specific to KML language. It is fully tested, actively maintained and is well documented. This also will involve fixing (6) security issues found through Bandit in Fastkml.

3. Creating a Package for providing samples

Users have to copy paste the path of samples through documentation. Developers have access to samples by path. I propose to create a package using xstatic-py specifically for providing samples.

Weekly Timeline

Upto May 4

- Make more contributions through issues and features to further my understanding of codebase.
- Understand and write tests through pytest to be comfortable with it
- Be well versed with PEP8 style of coding

Community Bonding Period (May 4 - 31)

- Thoroughly go through the OGC KML and MSS KML documentation
- Learn PyQt framework
- Learn Various QT Features for designing an efficient UI

Week 1 (June 1- June 7) :

- Feature #6 : Displaying recent loaded KML files in Browse Option
- Stretch Goal #2 : Add Support for FastKML

Week 2 -3 (June 8 - June 21)

- Feature #3 : Add External Map Images
- Support for Photo/ Screen Overlay

Week 4-5 (June 22 - July 4)

- Feature #2 : Make changes in Individual KML file
- Implement KML Placemark UI
- Add Test Case Samples

Phase I Evaluation (June 29 - July 3)

Week 6-8(July 5- July 25)

- Feature #1 : Display Multiple KML Files
- Implement KML Overlay UI
- Revisit Test Case Samples

Week 9 (July26 - August 1)

- Feature #4 : Merge and Create new KML File (Includes Validation of new KML File)
- Feature #5 :Functionality for Redraw Option

Phase II Evaluation (July 27 - 31)

Week 10 (August 2 - August 8)

- Stretch Goal #1 : Export and Save Active Flight Track as .kml
- Continue adding support

Week 11 (August 9 - August 15)

- Start creating package for providing samples (Stretch Goal #3)
- Polishing the Code for minor discrepancies
- Freeze Code

Week 12 (August 16 - August 23)

- Update the Documentation and ensure no part of KML Overlay is undone

Final Evaluation (August 24 - 31)

Final Week (August 24 - August 31)

- Prepare Final Summary and organise the work in a presentable form

Communication

- I will be available on the IRC/Slack and the mail during the daytime.
- I will be regularly reporting to my mentor(s) about progress about the project and any impediments that I may encounter.
- I will be writing weekly blog posts about my progress on the project.

Commitments

I have no other plans for the summer. I will dedicate most of my time to this project.

Eligibility

Yes, I'm eligible for Google Summer of Code.

Why this project and why I am best suited for it ?

This is the first time I have contributed towards Open Source. After going through a number of organisations and their projects, I finalised on MSS because of the approachable codebase. Also, I have worked with ILWIS (GIS) Software before, so I am familiar with mapping. I believe that this project will be an amazing opportunity for me to learn this summer.

I think I am aptly suited for this project because I have the technical skill required (Python, git, Qt, KML) and enough experience to tackle issues that will come up. Also I am willing to learn anything the project demands and will devote all of my time to it.

Are you applying for other Projects ?

No, I am only applying for this project.

Comments

Despite the proposal being selected or not, I'd like to get some suggestions on my proposal, and on how I can improve it. Thank you!