Compiling GRASS GIS on Android

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1   Introduction

GRASS GIS (Geographic Resources Analysis Support System) is a free and open source geographical information system which enables the handling of raster, topological vector, image processing, and graphic data. GRASS is released under the GNU General Public License (GPL). GRASS is currently used in academic and commercial settings around the world, as well as by many governmental agencies and environmental consulting companies. GRASS is an official project of the Open Source Geospatial Foundation.

2   Background

Originally developed by the U.S. Army Construction Engineering Research Laboratories (USA-CERL, 1982-1995), a branch of the US Army Corp of Engineers, as a tool for land management and environmental planning by the military, GRASS has evolved into a powerful utility with a wide range of applications in many different areas of scientific research.

GRASS (Geographic Resources Analysis Support System) is a raster/vector GIS, image processing system, and graphics production system. GRASS contains over 350 programs and tools to render maps and images on monitor and paper; manipulate raster, vector, and sites data; process multi spectral image data; and create, manage, and store spatial data. GRASS uses both an intuitive windows interface as well as command line syntax for ease of operations. GRASS can interface with commercial printers, plotters, digitizers, and databases to develop new data as well as manage existing data.

3   Idea

Main idea of the project lies within core of compiling GRASS GIS module in android platform. Since GRASS is written in Bourne shell script, and Python, and Android on Java Platform, through a bridge way we are porting GRASS GIS on Android. The following are the key point about the project idea.

- In the Linux environment, most of the modules of GRASS- GIS   on cross-compilation they create applications of the Linux type for Android.
- Android does need some preparation to compile/make .apk bundle from a compiled software, this is not prepared yet from the NDK.
- Once the .apk is installed, it has to open into an Android terminal and provide the GRASS GIS environment variables.
- wxPython interface running in the JavaVM of Android.

4   Project Plan

Before April 21:

- To familiarize myself completely with GRASS-GIS and it features.

- To involve myself in contributing some translations - just to get used to how to commit to SVN and such – and look for easy bugs to fix

- To get involved in the android platform (Installing necessary IDEs,NDK)

- To familiarize myself with wxPython and wxWindows

April 21 – May 19 (Before the official coding time):

- To do self-coding wxPython to improve my further understanding.

- During this period I will remain in constant touch with my mentor and the OSGeo community. I will remain active on Milling lists to discuss and finalize on the modifications (if any) that needs to be on existing ideas.

- Thus with the help of my mentor and co-mentor I will become absolutely clear about my future goals, challenges and risk that would come on the way of implementing the ideas

May 19 – June 23 (Official coding period starts):

- Define all the required implementation of compiling Grass GIS on android.

- Define required libraries and modules on trunk with the updated dependencies.(using C)

- Work on SVN trunk directory with sufficient material for setting up our own Android compilation.

This will help in testing of the proper working of the entire code base and appropriate changes will be incorporated later if necessary.

June 23 – June 27:

- Bringing about the decided changes in code base and looking forward to incorporate more changes.

- Testing the overall working of each and every module of the modified source code with the help of Python Test Suites.

JULY 27th last day of MID TERM EVALUATION

June 28 – August 11 (Official coding period again starts)

- Making further changes in the code to improve the Functionality, Exception handling, Bug Removal.

August 12 – August 20:

- To be in constant touch with the mailing list and to let them know about our progress.

- Most of the time will be consumed for rigorous testing and bug fixes.

August 20 – August 22:

- For Documentation

- Final preparation to submit the code base to Google.

A Buffer of two weeks has been kept for any unpredictable delay.

5   Explain how your SoC task would benefit the OSGeo member project and more generally the OSGeo Foundation as a whole.

As I am driven by the principle of "Always work for the common Good", I do hope my SoC work would bring some improvement and widens application of GRASS GIS .Since GRASS GIS is the official project of open source Geo-spatial

foundation, the improvement and development carried out on GRASS GIS would certainly help in the further development of such open source project.

The success of this project would be very beneficial to the organization as it would give rise to new library, new plugins which can be applicable on a wide range project.

The success of this project also mean a wide range of applications over many research and case-studies that involves GRASS-GIS.

Compiling GRASS GIS on android has much more applications and usages. On the top of it, we can carry out other related tasks. So, I do hope my SoC task would carry more benefits to OSGeo member project and OSGeo foundation as a whole.

6   Please provide details of general computing experience: (operating systems you use on a day-to-day basis, languages you could write a program in, hardware, networking experience, etc.)

I am currently the third year student following Software Engineering course. Through the course of my student life, I am engaged in different programming-based projects. I used to make myself familiar with different computing technologies. I have completed various projects based on C++, asp.net and more often JAVA. In regard to the operating system, currently I am using Ubuntu 13.10v and Windows 8.1 as a dual operating system in my day-to-day basis. I have completed Data Communication and Networking modules in my University during my second year of study. I have actively participated the following programs and workshop:

- MIT-GSL 2014 Team Member
- Java Colombo Anniversary Meet up 2013
- Microsoft- Mobile Application Development Camp
- Microsoft Student Champs Meetings(Actively Participating since 2012)
- Google Developer Group (GDG-Colombo)
- Google MapUp@SLIIT

7   Please provide details of any previous involvement with GIS programming and other software programming:

Since then I have attended FOSS4G Sri Lanka 2014, I am amazingly interested in GIS tools and technologies. Even though I am a novice GIS programmer, currently I am involving myself in learning more about GIS. Besides GIS programming, I have done various software programming project using Java, MySQL, HTML5, CSS and Jquery. I am familiar with android apps development. I have developed and deployed mobile, desktop and web applications using above mentioned technologies.

- A Desktop based application using J2SE,MySQL and MVC Framework
  "Advanced Inventory Control System (ICS) for Singer Plus
- Hospitality Booking Engine(HBE) using HTML5,CSS,JQery,PHP 5.0 with Laravel Framework
- Android Based Game for Dyslexic Children(Currently ongoing for MIT-GSL)

8   Please tell us why you are interested in GIS and open source software:

A Geographical Information System (GIS) is a database that allows the user to explore spatial relationships within and between data sets. I even aware of its wide range of application over the ecological research. I have been participating in various workshop and seminar based on ecological research (including climate change and its mitigation), I am really interested in GIS application over these aspects. When it comes to Open Source Software, I always advocate its uses. What I personally believe is everything that is aimed for the common good should be available and reachable to everybody. And when it comes to technology, it should be followed strictly in order to prevent the digital divide. I am currently the secretary of SLIIT FOSS community. So Open source software have always been my interest.

9   Please tell us why you are interested in working for OSGeo and the software project you have selected:

Since I was interested in working with GIS, I went through the list of GSoC project and mentor organization. I got to know OSGeo has again got selected for the mentor Organization .Then I moved my eyes through all the project and member project under the mentorship of OSGeo. They have really cool projects. I am interested in working with new area of technologies. When it comes to this particular project, I am really fascinated and started searching about GRASS GIS more on internet. And finally, I decided to go on this project. Even though this seems to be very new and sophisticated to me but I am mentally driven to go on with this project.

10   Please tell us why you are interested in your specific coding project:

Previously, I have worked with the technologies related to android and have completed various project based on those technologies. I am familiar with Java and started learning Python programming. Python programming has fascinated me then. I started making myself familiar with wxPython and wxWindows which are related to this specific project. I have tried to fix the bug on SVN trunk and still learning more about it. I have already started tweaking on wxPython and also started studying about the risk and potential of wxPython over android platform, thanks to the mentor .since this coding project involves the technologies that I am really interested in, this particular project drives my interest.

11   Would your application contribute to your ongoing studies/ degree? If so, how?

Currently, I am third year student following the software engineering module. I am planning my final year research project based on   GRASS-GIS. If I got to work on this particular project, then it would help me a lot in gaining more information and knowledge   about my research project. It would elaborate and broaden my knowledge and skills on GIS.

12   Please explain how you intend to continue being an active member of your project and/or OSGeo AFTER the summer is over:

I would always focused myself in further improvement and analysis of the project. I would help and advice to anybody who are really interested in this particular type of project. I would share my knowledge and experiences and the lesson I learnt in implementing this particular project. Not only this, I would encourage my friends and colleagues to bring new and cool ideas and suggest them to put them forward on OSGeo community. It would increase the involvement of people with OSGeo Community.

13   Do you understand this is a serious commitment, equivalent to a full-time paid summer internship or summer job?

Yeah I do and I will commit myself to the successful completion of the project.

14   Do you have any known time conflicts during the official coding period? (May 19 to August 19)

In regard to time conflicts, I have my University exam starting on early weeks of August.