The development of User Interface for Multi-Beam data processing in Linux

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### Introduction

The IHO will intend to develop a suitable open-source based processing package which is produced a low or no cost software solution for the logging and processing of survey data.

#### Purpose

On the above purpose, The MB-System is a best choice of package to process the swath mapping sonar data. Due to its command line interface, the novices or MS-window users feel inconvenient for usage.

#### Investigation

To get ride of this inconvenience, Develop the User interface of MB-System for more efficient MB-data processing in Ubuntu Linux system.

※ **MB-System**: Data Processing Package for Multi beam Echo Sounder, Side Scan Sonar
Data Processing Package made by Columbia University. The MBM UI was developed using open-source software tools. These included the Eclipse, and the JDX software development tools. The applications were developed using Open Source Linux Operating System.
## Environment of Operation and Development

### Operating environment

<table>
<thead>
<tr>
<th>Division</th>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
<td>CPU</td>
<td>Intel core 2 or above</td>
</tr>
<tr>
<td></td>
<td>Main memory</td>
<td>1 GB</td>
</tr>
<tr>
<td></td>
<td>Hard Disk</td>
<td>100 GB</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td>OS</td>
<td>Linux 2.2.x or above</td>
</tr>
<tr>
<td></td>
<td>JAVA</td>
<td>Java Runtime Environment (JRE) 1.5.x or above</td>
</tr>
<tr>
<td><strong>Tool</strong></td>
<td>JAVA Editor</td>
<td>Eclipse 3.x or above</td>
</tr>
<tr>
<td></td>
<td>JAVA Compiler</td>
<td>JDK 1.5x or above</td>
</tr>
</tbody>
</table>
Design of System

- **Problem**: Inconvenient user interface for novice or MS-window user

- **Solution**: Developing User Interface, The executable commands of MB System convert to graphic button

Diagram:

- **User**
  - **Shell View**
    - **Shell execute**
    - **Shell edit**
    - **Help View**
      - **Help edit**
      - **Display**
        - **insert**
        - **update**
        - **inert2**
        - **update2**

Design of System

MB System has two types of result display, the one is terminal text display and the other is graphic display in window.
- Terminal execute: Display the result and Finish
- Window mode: Transfer the results to MB System manager

User choose Shell Script execute in window mode.
- Insert mode: Insert new shell script.
- Update mode: Update the established shell script.

User choose Help file Editing mode in window
- Insert mode: Compile documents for MB system command.
- Update mode: Modify established document for MB system command.
System installation and Environmental Setting

**Preparation**
- Operating System: Linux operating system
- Generic Mapping Tool for graphic output
- MB-System for processing swath data

**Environment Setting**
- Changing system shell to csh or tcsh
- Installing ghost script or postscript viewer
- Type `mbdefaults -Dgv`

**MBM installation**
- Copy MBM program to $HOME directory
- Extract MBM.tar
- Edit the `.bashrc`: `export PATH=$HOME/mbm:$PATH`
- Source `.bashrc`
Design of file structure

**Sh directory**
- contain the shell script files of MB-System

**Hlp directory**
- contain the help files of MB-System
MBM Program

1. Full-down Menu
2. Save the command and help file after editing
3. Execute MB-System shell script
4. Clear the contents of
5. Inform the current MB-System command
6. Show and Edit the current shell script
7. Show and Edit the help file
8. Display the results of the current command
MB-Data processing

Track chart
MB-Data processing

Plot

mbm_grdplot
mbm_grd3dplot
mbm_plot

Track-line

2362 pings read and plotted
pdsentmap. Constructing basemap

Total line count: 35
Plot generation shellscript <.dataset_all.xml> created.

Instructions:
- Executing <.dataset_all.xml> to generate Postscript plot <.dataset_all.ps>

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MB-Data processing

Anyongbok seamount in East Sea
Conclusions

- To develop UI for MB-System using open source is the aim of this project. Although some of programs in MB-system package are not fully expressed in MBM, it shows meaningful performance and results.

- The JAVA program is designed by the full-down menu method, so all users could easily understand the source code. To use this application for better, I put the storable and editable function, so processed scripts files can be reused.

- Also I am releasing the digital source code of the MBM program for all users in the attachment and, if necessary, you can modify and compile the source code.

- I hope MBM UI application could contribute to the development of the hydrographic fields.
Thank you

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