Gracoli: A Graphical Command Line User Interface

Pramod Verma
Johns Hopkins University
Dept of Computer Science
Baltimore, MD, 21218, USA
pramod@cs.jhu.edu

Abstract
Command Line Interface (CLI) is the most popular and basic user interface to interact with computers. Despite its simplicity, it has some limitations in terms of user experience. For example, sometimes it is hard to understand and interpret the textual output of the command. In this paper we describe the limitations of command line interfaces and propose Gracoli\(^1\): A graphical command line interface that takes advantage of both text-based interface and graphical user interface to provide better user experience and perform complex tasks. We demonstrate some of the useful applications and features of Gracoli. Sometime such a hybrid system provides and combines the strengths of CLI and GUI to perform specific tasks. We explore some useful applications of Gracoli to create a new kind of user experience. Command line interface makes accessibility faster and Graphical User-Interface makes output more interactive and understandable.

Author Keywords
Command Line Interface, Gracoli

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H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

\(^1\)Gracoli: http://www.gracoli.com
Introduction

Command Line Interface (CLI) or terminal interface is the basic tool for interacting with computers. It was invented before the development of windowing systems and Graphical User Interface (GUI). At that time user interaction with the computers was primarily by means of Command Line Interface. Those systems were completely text-based without pictures or graphics support.

At present all kind of operating systems include this utility. It is mostly used by advanced users such as developers and systems administrators. The user simply types commands, and the system displays results after executing the command.

Despite its simplicity, it has some limitations in terms of user experience such as lack of instant hints, sometimes it is hard to understand output, limitation of application interactivity.

This paper proposes Grocoli: A graphical command line interface to overcome those issues.

Prior Work

Many software or application interfaces use a hybrid interface of CLI and GUI. For instance programming editors or IDEs, such as Eclipse, scientific applications such as Matlab, and Workflow Editors [2] use CLI for the purpose of debugging.

Sometimes such a hybrid system combines the strengths of CLI and GUI to perform specific tasks, such as intrusion detection (ID)[4]. Researchers also attempted to combine command line with browser[3].

Some patents [1] also provide a background about hybrid interfaces.

Gracoli Prototype

Our prototype consists of a window user interface that resembles the existing command line interface. In addition we display visualization and application as an output of commands underneath the current command line.

```
[pramod@node001 ~]$ df
[pramod@node001 ~]$ df - report file system disk space usage
```

To implement a proof of concept, we set up an apache web server and designed Gracoli interface using PHP with HTML and AJAX. Our use of CSS makes the Grocoli page looks like a command terminal. Our interface has HTML input field that takes user input and sends POST data to a server using AJAX. Server page interprets the parameters and uses PHP system() command to execute command and visualize the output.
User can set date and time just typing command `date` that renders an interactive clock UI.

**Visualization and Interactivity**

In instant hint feature, whenever user types a command with its options, system displays hints for its usage, synopsis, and description in an overlay near the current line. For example in the figure 3, as soon as user types `df` command, system displays its meaning with options. This feature is useful for both beginner and expert users. In a normal command line interface, we generally use `man` command for the assistance.

**Interaction with output**

User can interact with the output of the command. For example in figure 5, user can use mouse to perform file operation such as open, delete, rename, etc.

Gracoli can be extended to perform instant search for local files. To start instant search, the user has to type `locate` command with a keyword. As a result Gracoli displays all files and folders in a window just beneath the current command. This enables the user to directly use the mouse to click and open the files.

**Application Mashups**

We demonstrate some of the useful application mashups (integration) in the Gracoli platform. For example, In the facebook mashup, user can see Facebook newsfeed updates by typing `facebook -n` command. (figure 7)
Figure 6: An example of a search application in which command `google -m Stockholm` renders a map of Stockholm.

Figure 7: Examples of a collaborative application on the Gracoli platform. Command `facebook -n` displays facebook newsfeed.

Figure 8: Command `wifi` renders the user interface to set up the wireless network.
Another example is a search application, such as Google Maps (figure 6).

We also integrated desktop applications with terminal. This feature enables users to interact with commonly used desktop applications such as editors (e.g., figure 10), to-do lists, utilities (e.g., figure 8), calendars, email (e.g., figure 9), chat clients, etc. in a user-friendly way.

In this way Gracoli provides rich interactions with the desktop, internet (e.g., figure 6), and various **collaborative** applications (e.g., figure 7 and figure 11). Gracoli can be used as a platform for running various apps similar to the Google Chrome browser.

**Remote Desktop and Cloud Connect**
Gracoli can be used as a platform independent application. It may provide an interface to interact with remote resources, such as files, programs, or data.

![Figure 9: Command `email` -c renders the email client to compose a new message.](image)

![Figure 10: Command `notepad` starts a text editor application.](image)

![Figure 11: Command `wiki` [query] displays search results from Wikipedia.](image)

A grape is a fruiting berry of the deciduous woody vines of the botanical genus Vitis. Grapes can be eaten raw or they can be used for making wine, jam, juice, jelly, grape seed extract, raisins, vinegar, and grape seed oil. Grapes are a non-climacteric type of fruit, generally occurring in clusters.

The cultivation of the domesticated grape began 6,000–8,000 years ago in the Near East. The earliest archeological evidence for a dominant position of wine-making in human culture dates from 8,000 years ago in Georgia. Read More
Figure 12: The open command opens a file (or a directory or URL). If no application name is specified, the default application is used to open the specified files. For example, command open shows the preview of a photo.

Gracoli can be considered a web-based operating system where information and applications can be accessed online.

It can be used as a Dropbox-like application where users can store, share, and manipulate files and data by interacting with the command line applications. In addition, cloud computing can be used to synchronize all data and applications to all devices connected with Gracoli.

**DISCUSSION AND FUTURE WORK**

In this way, we present the interface to increase the interactivity in existing text-based command line interface. Main uses of command line interface are for scripting and automations, but here we present other applications such as Facebook, finding maps, etc.

This paper shows early results. The work is still in progress, and future work may involve design and implementation of the application with detailed user studies over existing interfaces. Demo is available at http://www.gracoli.com

**References**


