

Name: Xavier Williams
Advisor: Whit Smith
Group: The Dream Team

Tools Used to Create GUIs and Applications of GUIs

Introduction

A GUI is a graphical user interface. GUIs allow users to interact with electronic devices or data stored on electronic devices. Elements of GUIs can include windows, pull-down menus, buttons, scroll bars, icons, and other items that may be useful for viewing and analyzing data. Most applications and operating systems used today are GUI based. This paper is a review of tools that can be used to create GUIs and applications of GUIs.

How GUIs Work

A GUI uses windows, icons, and menus to carry out commands such as opening, editing, deleting and moving files [1]. Actions performed in GUIs are preformed through direct manipulation of graphical elements.

Integrated Development Environments for Creating GUIs

GUIs are created using C++, Java, Python, and other programing languages. Most GUIs are created using an Integrated Development Environment (IDE).

Qt

Qt is an integrated development platform that can be used to create GUI in the form of desktop apps or mobile apps. GUIs created in Qt can be cross platform applications. Qt supports multiple types of version control and has tools that allows the GUI code to be optimized and debugged [2].

Visual Studio

Visual Studio is an IDE made by Microsoft that can be used to make GUI applications as well. Visual Studio has debugging, testing and version control tools like Qt. There is a Windows version of Visual Studio that can be used to develop any kind of application and there is a version being developed for Mac that is designed for making cloud, iOS, Android, macOS, and wearables [3].

MATLAB

GUIs can also be created using MATLAB. The MATLAB GUI IDE is called GUIDE (GUI Development Environment). GUIDE allows the designer to graphically design the GUI using a layout editor then the MATLAB code for the user interface (UI) is automatically generated. After the UI code is generated the program can be modified to behave how the application is supposed to function. MATLAB

GUIs can also be created programmatically. Creating the GUI programmatically allows the designer to have more control over the elements and their properties in the GUI [4].

Aspects of Useful UI

UIs need to be easily useable and navigable for the end user. The UI also needs to be highly responsive so the user does not experience lagging when it's trying to keep up with their input. There should be a way to easily update or make changes to the UI [5].

Examples of GUIs

Operating Systems

Common application of GUIs are operating systems. GUI operating systems are easier to learn and use because commands do not have to be memorized, where as a command line operating systems requires the user to know the commands to use the device. Some examples of GUI operating systems are Microsoft Windows, MacOS and Chrome OS. The ease of use of GUI operating systems is what caused them to be the dominant operating system by today's end user [1].

ToxPi GUI

ToxPi GUI is an interactive visualization tool for transparent integration of data from diverse sources of evidence. ToxPi GUI was created using Java. This GUI allows data files to be taken in and allows the user to run analysis on them. The user can also take data from multiple files and run analysis and put the results into graphics for the user [6].

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