Orthoscopic/Arthroscopic Camera Software Project Brief

Description

The Orthoscopic/Arthroscopic Camera requires an application to display live images into computers. The software package provided in this project allows one to modify this application and add functionality to it.

High Level Architecture

The C# files involved in this project and their relationships are shown in Figure 1. They are classified according to functionality and prerequisite programming experience in Table 1. The Graphical User Interface files allow the addition of Buttons and Primitives to the application. Advanced coders can modify or add Pre-defined Classes to the project. Additionally, runtime optimizations and additional third party libraries can be added by advanced programmers.

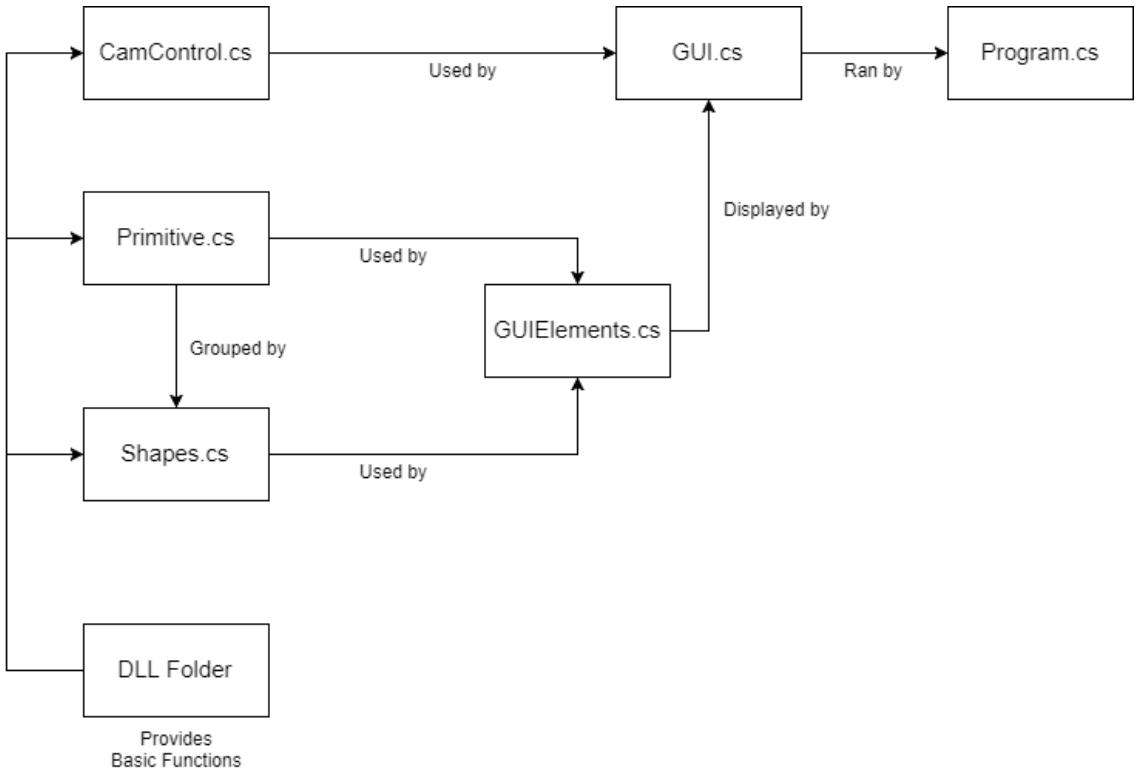

Figure 1 - High Level Architecture

All Users	Advanced Users	
Graphical User Interface	***Pre-defined Classes***	***System Files***
GUI.cs	CamControl.cs	Program.cs
GUIElements.cs	Primitive.cs	dll Folder
	Shape.cs	

Table 1 - C# Files

Coordinate System

The coordinate system is shown in Figure 2 with positive x towards the right and positive y downwards:

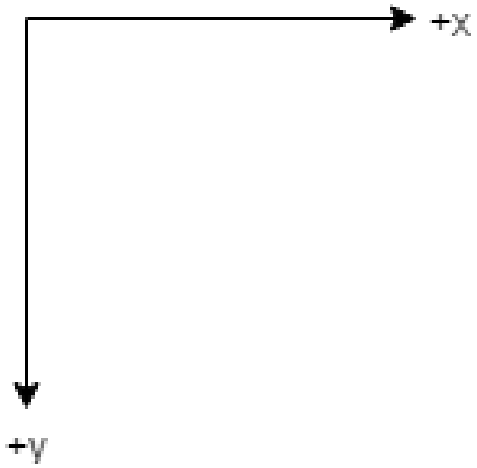

Figure 2 - Coordinate System

GUI Primitives and Shapes

Classes (Primitive.cs and Shape.cs) are used to create Primitives and Shapes. Primitives are components such as Lines, Squares, and Text which are instantiated programmatically and modified during runtime.

Shapes are collections of Primitives that are used to construct complex figures. Additionally, animating figures can be made simpler with the proper use of a Shape object.

The first Primitive that is added to a Shape defines it origin. All subsequent Primitives are located relative to the Shape's origin. An illustration of this effect is shown in Figure 3, with the Circle as the origin shape. Consult the Cheat Sheet for details on the origins for each kind of Primitive.

Examples of using the Primitive and Shape classes can be found in the Adding Elements to the Viewfinder section of the Getting Started guide, or in the Cheat Sheet.

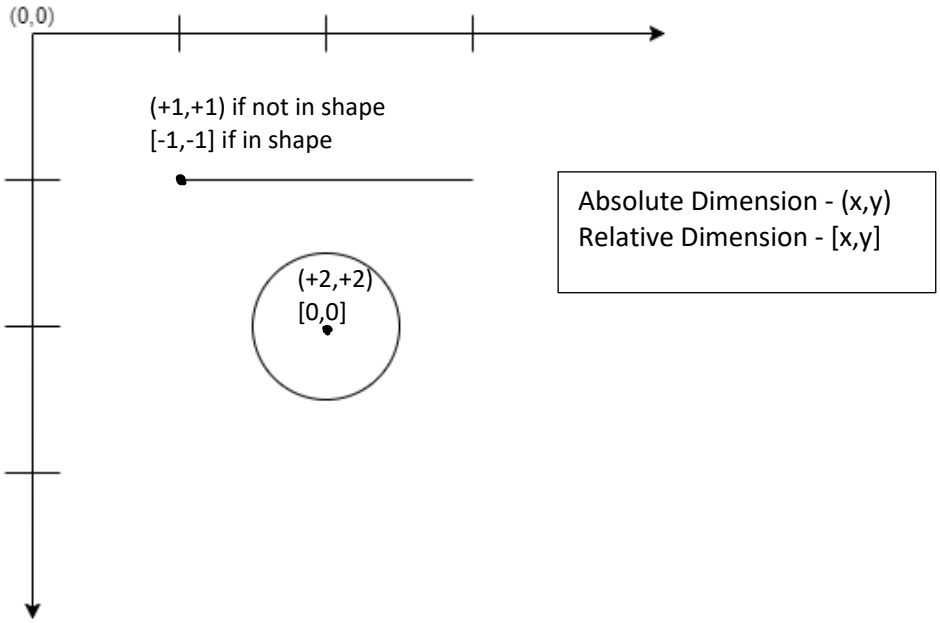

Figure 3 - Coordinates In and Out of Shape

Animation

To animate Primitives and Shapes drawn in the Viewfinder, the coordinates of the points are incremented or decremented in every successive incremental frame. The Run() method of GUIElements.cs is called every frame, so one can implement the animation logic in the Run() method. Examples that animate Primitives and Shapes are shown in Steps 3-5 of the sample code included within the GUIElements.cs file.