Vertically Integrated Projects

OpenHID Lab

FIU School of Computing & Information Sciences

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Multi-Modal Interactive Paint, Version 3

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Problem

Currently on PCs, input is usually limited to the keyboard, mouse, and maybe a joystick or camera.

There are many alternate interactive input devices available, and with this project we aim to showcase some of their uses and future possibilities, particularly when multiple input devices are used in conjunction.

This project is a complete rewrite, from scratch, of the iteration last semester.

Current System

Status:

- Support for many easy to use tools
- Ability to directly change program state using an input device (leap motion)

My core contributions:

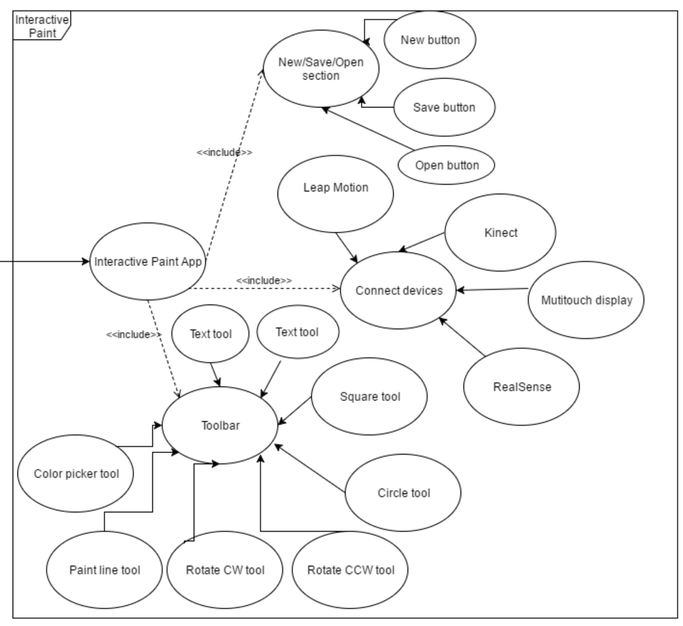
- Cinder based GL context
- User interface, using NanoGUI
- All drawing tools (square, circle, etc.)
- Resizable elements

Requirements

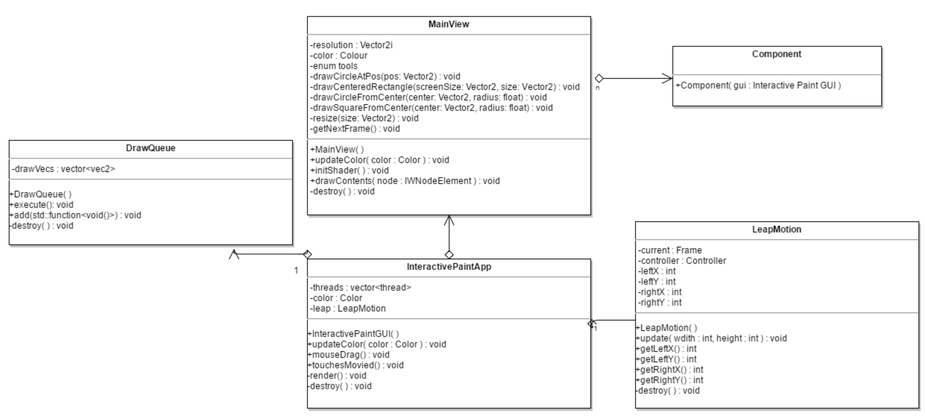
Our job was to rewrite the previous version of the of the paint app in a way that it would be a maintainable project for the future.

- As a developer, I want to use NanoGUI for controls and Cinder as a GL abstraction so I can be more efficient
- As a user, I want to be able to use some basic tools (New, Save, Line, Rotate, and color select).
- As a user, I would like to have an endpoint select line tool, a text tool, and an open button.

System Design



Object Design



Implementation

We used a few key technologies:

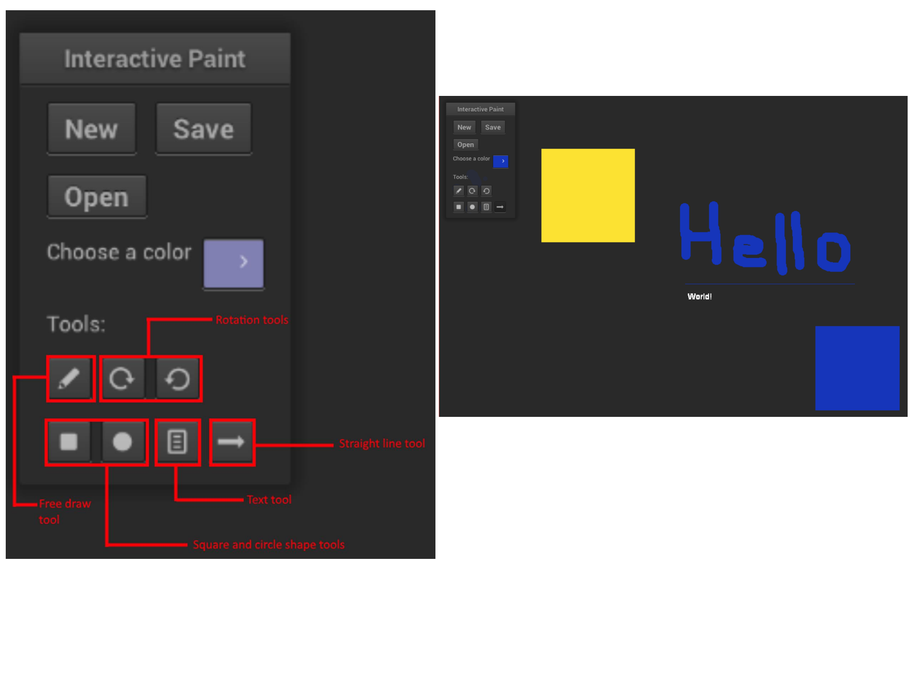
Coded in modern C++

OpenGL abstraction layer

NanoGUI UI elements

SDKs for input devices

Screenshots



Verification

Test case: Draw circle

Purpose: Test to see if a circle is drawn properly

Preconditions: Color is set to a value c

Action: with circle tool active, press an initial position, O, and drag out a distance, r, from the center and release mouse

Expected result: Value of pixel at point r away from O should be the preset color c

Summary

- Interactive Paint showcases the possible features that new input devices can add to an application
- Future iterations will be able to add more input devices to provide innovative features
- The use of VR as an input device will greatly enhance the features of Interactive Paint and provide an entirely novel experience

Acknowledgement

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