Pixel Art Editor

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Abstract

This paper presents a simple pixel art editor implemented in C using the SDL2 library. The editor allows users to draw and edit images at a pixel level within a 32x32 grid. Basic functionalities include drawing, erasing, and selecting colors via keyboard shortcuts. The project serves as a foundation for further improvements, such as undo/redo capabilities, saving/loading functionality, and a more user-friendly graphical interface.

Keywords-

Pixel Art Editor, SDL2, Graphics Programming, C Language, Input Handling, Rendering, Grid System.

I. Introduction

Pixel art is a form of digital art where images are edited at the pixel level, widely used in retro gaming and low-resolution design. This project implements a simple pixel art editor using SDL2, a powerful multimedia library that facilitates graphics rendering and input handling in C.

The objective of this project is to provide a lightweight and efficient tool for creating pixel-based drawings, offering essential features while maintaining an intuitive interface.

II. System Design and Implementation

2.1 Graphics and Rendering

The application utilizes SDL2 to render a 32x32 grid of pixels, each represented by a 20x20 square. The rendering loop continuously updates the screen to reflect user interactions.

2.2 Input Handling

User interaction is facilitated through both mouse and keyboard inputs:

Mouse Input:

Left-click: Draw using the selected color.

Right-click: Erase (turn pixel white).

Keyboard Input for Color Selection:

R → Red

G → Green

B → Blue

W → White

K → Black

2.3 Grid System

Each pixel in the canvas is mapped to a 20x20 square, allowing precise pixel-based drawing and erasing. The program efficiently manages grid rendering and updates to ensure smooth operation.

2.4 Rendering Loop

The SDL2 loop continuously listens for user inputs and updates the grid accordingly. This ensures real-time feedback for a seamless drawing experience.

2.5 Cleanup and Resource Management

To prevent memory leaks, SDL2 resources are properly released upon program termination.

III. Results and Discussion

The pixel art editor successfully allows users to create simple pixel-based drawings with minimal latency. The implementation of a keyboard-driven color selection system enhances usability. However, certain limitations exist, such as the lack of undo/redo functionality and an advanced color selection palette.

IV. Future Enhancements

Several improvements can be incorporated to enhance the usability and functionality of the editor:

Undo/Redo functionality: To allow users to revert mistakes and improve editing efficiency.

Saving and Loading Drawings: Enabling users to store and retrieve pixel art creations.

Expanded Color Palette: Providing more color options for creative flexibility.

Graphical User Interface (GUI) Enhancements: Improving the visual appeal and accessibility of the editor.

V. Conclusion

This project provides a functional base for a pixel art editor using SDL2. By implementing core features such as drawing, erasing, and keyboard-based color selection, it offers a solid starting point for future expansions. With further improvements, this editor can become a more robust and versatile tool for digital artists and game developers.

VI. References

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