

SKETCH MASTER - A LEARNING TOOL FOR ART AND DEXTERITY

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INTRODUCTION

In the days of olde when we roamed through the digital world with only a mouse and keypad, you would find many combatting with a beast known as Microsoft Paint. They would draw on with aching fingers and small icons, creating shaky lines and bright colours. Now those days are gone, pencils and fingers replacing the humble mice. But we miss those days and want to bring back the joy and the pain of drawing with a mouse.

We bring you Sketch Master, an interactive teaching tool that uses a game format to get better at drawing with a mouse. Players will be given images of various complexity to recreate. They are given points based on accuracy. Timed modes will provide an additional challenge. In a multiplayer option, players will face off on the same set of images in a see-saw between quality and quantity.

IMPLEMENTATION

The project will be implemented on the De1-SoC. We will use two mice to interact with the system and allow the user to draw on the screen. A set of preselected images will serve as the reference to learn. The images will be stored in a pixel format (as opposed to vector) in the form of a binary matrix and also serve as grader matrices.

The user input will be stored in a similar matrix and a score will be generated based on how closely the user data points fit into the outline. Modes will get tougher with finer granularity - a greater challenge for the system as well - and the game can be timed for an added thrill or untimed for a relaxing experience.

We plan to implement the Avalon Bus on the FPGA to connect with the Display via the VGA. We will also use the parallel capabilities of the FPGA to perform the grading check.



Figure 1 Proposed Display

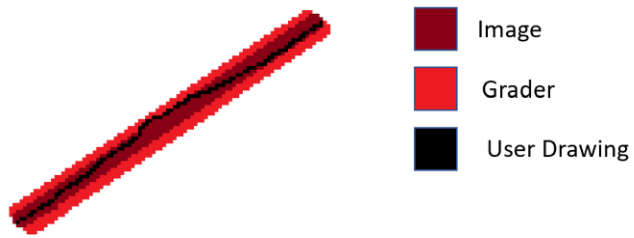


Figure 2 Proposed Grading Scheme on a zoomed-in line

Milestones

Milestone 1

- Interfacing the USB Mouse
- VGA Setup
- System Design
- Algorithm for Grading

Milestone 2

- Basic UI Design
- Drawing capture and Storage
- Drawing Grading
- Hardware Implementation of Grading Algorithm

Milestone 3

- Beautification of UI
- Single player Mode
- Multi player Mode