Emergent Architecture Design

1. Introduction

This document will have a high level description of software and hardware components of our games project.

1.1. Design goals

- **Performance**
  The input of the player should be processed within a reasonable time. If it takes to long the players won't have the feeling of satisfaction when creating their art. It will cause frustration, so it is an important design goal. The game needs to feel responsive.
- **Easy use**
  Players should be able to play the game easily. It doesn't require any hardware on the player's end. It has no learning curve, the player should be able to play the game instinctively.
- **Easy join/leave**
  Players will have to be able to join and leave the game without problems. There is no login or logout. Players have to be able to walk on the canvas to join and walk off to leave.

2. Software architecture views

This chapter discusses the architecture of the system. The system is first decomposed into smaller subsystems and the dependencies between the subsystems are explained. In the second paragraph the relation between the hardware and software of the system is elaborated. The third paragraph illustrates the data management of the system.

2.1. Subsystem decomposition (sub-systems and dependencies between them)

- **Game Engine Layer**
  The canvas of the painting needs to be rendered and changes needs to be applied every cycle. The engine should then redirect its images to the display layer
- **Output Layer**
  The painting that is being drawn needs to be displayed to the player, this layer takes the images of the game engine and sends in to the corresponding output devices.
- **Image Processing Layer**
  All player input comes from processed camera input of the player this layer should parse the input to an understandable format for the game engine.

2.2 Hardware/software mapping

A camera is present to observe the players in the playing field. It redirects all its output to the Image processing layer on a separate system. Here the image processing will be done it should detect players entering or leaving the playing field, detect brushstrokes being made by the players and requests by the players to change their current colour. This will be sent over a LAN network to another System connected to a beamer and running the game engine. The game engine takes the image processing output and performs the detected actions to the game. Afterwards it submits the image to the beamer to be displayed.