1. Introduction

Tiled displays are an emerging technology for constructing large scale displays that can be used for many purposes. We decided to build a multi-projector system to make a live modern dance performance more immersive and entertaining for the audience. The system was built using six standard definition projectors connected to three low range PCs running custom made video playback software which enabled them to perform geometrical correction of input video in real time.

2. Problem description / Motivation

In order to build a multi-projector system several problems have to be solved. Geometric correction is very important because we want to obtain a seamless projection. Real time video playback is also very important because it allows change of video content displayed very easily without the need to transcode the input video. And finally, generating video content for display is very important because we want to use the system to improve the quality of live dance performance.

3. Geometric correction

The main problem is to compute a 3x3 matrix $H$ for each projector, the so called homography matrix, which defines mapping between projector image and input image.

4. Real time video playback

Real time video playback is possible by using a custom made OpenGL video player which uses pixel shaders to accelerate geometric correction. Client-server architecture enables us to use the system in different configurations.

5. Content generation

Content was generated using Adobe After Effects, MAXON Cinema 4D and Processing programming language.

6. Conclusion

A tiled multi-projector system for panoramic visualization was presented. The system was built using six projectors connected to three PCs running custom made software for real time video playback. Video content generated using special software coupled with the tiled multi-projector system for panoramic visualization created a more immersive experience for audience in a live dance performance.