previzart - Interactive 3D Previzualisation System

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1 Introduction

3D previsualisations are a common tool for the planning of complex film scenes. They are usually produced by animators on the basis of a storyboard. In currently established workflows, the creative heads of the film team must communicate their ideas verbally to a 3D operator, which is often time-consuming, technical and uncreative. The Previzart system offers an innovative, simple-to-use 3D interface and workflow for the team-oriented creation of animated 3D previsualisations. It gives everybody the opportunity to try and show ideas in a mixed-reality environment and eases the discussion between the creatives. The system is portable and works on consumer hardware.

2 System Components

The system consists of a laptop, a video camera on a boomstand, and a 7 touchscreen. It combines ART+ for real-time tracking and TouchDesigner from Derivative for data processing, 3D animation, rendering and video augmentation. It is ideal for use in a conference room with a beamer or large format TV set.

3 Workflow

When the system is set up, the users put tracking markers with individual graphic codes on the conference table into the viewing area of the video camera. Any 3D object in fbx file format can be dragged from the file browser into the Previzart interface and onto the video image of a marker, which establishes a connection. The object is immediately rendered onto the marker and the users can now position the virtual object by moving the real marker in real-time. This process can be used to position virtual set pieces, props, characters, cameras and lights. If an object's position is satisfying, the user covers the connected marker and removes it from the video camera view, leaving the 3D object in its given position. This can be repeated with up to 512 markers to create a complex scene, without having to worry about overlapping marker positions. Movements can be recorded as animation sequences. If any object position or animation needs to be adjusted, the specific marker can be put into the scene again and the position or animation of the 3D object can be re-recorded. A touch screen with an attached marker enables the user to move and look through virtual cameras, record and zoom intuitively. After the session all camera views can be exported as QuickTime video files.

4 Prior Work

We have implemented a Shared Memory Interface to connect ART+ and TouchDesigner from Derivative [Rodney Berry et.al. 2008]. Previzart with ID-encoded marker tracking differs from SCP Camera [Xavier Gouchet et. al. 2007] in that it enables the user to layout and animate entire 3D scenes with virtual objects, characters, cameras and lights.

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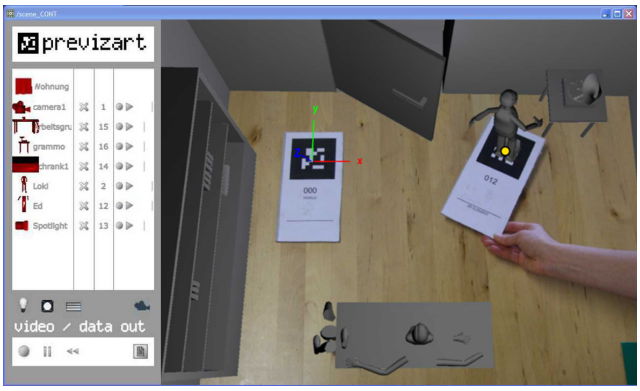

5 Implementation

One great advantage of ART+ is the use of ID-encoded marker detection. For each marker that is identified a new marker object is created that stores information about the ID, size, center and position in world and in camera space. All markers that are identified by the system are stored in a list. The first marker (ID=0) defines the world space, and the other marker positions are stored in relation to this space. If the first marker is not identified in the current video image, the stored position and orientation is used. The application was built using TouchDesigner, a real-time 3D authoring software by Derivative. Special operators are provided for data processing, 3D animation, rendering and video compositing. In addition TouchDesigner offers a scripting language and eases the creation of user interfaces for interactive applications. Upcoming features include the possibilities to pick and modify 3D objects directly on the touch screen and to import motion capture data and animation for character performance. Shared Memory is used to allow ART+ and Touch Designer to access the same video image and exchange data.

6 Conclusion

Previzart is developed and tested in cooperation with filmmakers to suit to their needs. It gives the team the opportunity to intuitively explore sets and develop film scenes together virtually, before they are built and shot, which saves money and adds creative freedom in the pre-production process. The system structure is modular, so it can be modified to a specific production's needs or other fields of work or edutainment. The experience can be enhanced by using high-end tracking solutions. Website: www.previzart.com

References

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