

# SCP Camera

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Figure 1: SCP Camera : Demo Scene

## Abstract

Shoot Cut & Play Camera (SCP.Camera) is an application combining a real-time montage interface and an immersive device. It provides to film-maker or camera operator an easy tool to set up their work or previsualization. User can activate actors animations, record the virtual world, and edit sequences before exporting them to a 3D software.

**Keywords:** camera, interactive, immersive, device, montage, virtual reality, cameraman, storyboarding, realtime, motion tracking, animation, prototyping

## 1 Introduction

Shoot Cut & Play Camera (SCP.Camera) is an application combining a real-time montage interface and an immersive device. It provides to film-maker or camera operator an easy tool to set up their work or previsualization. User can activate actors animations, record the virtual world, and edit sequences before exporting them to a 3D software.

This application gives the opportunity to evolve in a 3D environment, either with a 6 DOF tracker and the SCP.Camera Device, or with a mouse-keyboard interface, and to shoot a virtual scene like one would do with a real camera.

The innovating aspect is, on the contrary of traditionnal montage systems which work on recorded images, the application works directly with the camera motions and parameters (zoom, dof), which

we can edit and use in other 3D softwares (Maya, Virtools, ...) in order to get a quality output.

## 2 Exposition

The real-time part was developed with Virtools (a real-time engine) and is organized around three main function of the project : shoot, cut and play. Those functions describe the different modes that allows a complete use of SCP.Camera through the creation process : from the recording of camera movements, their montage until the final 3D rendering. Each function is partitionned in a distinct interface, with a color code. This gives a way to orient the user in the differents step to realise a project.

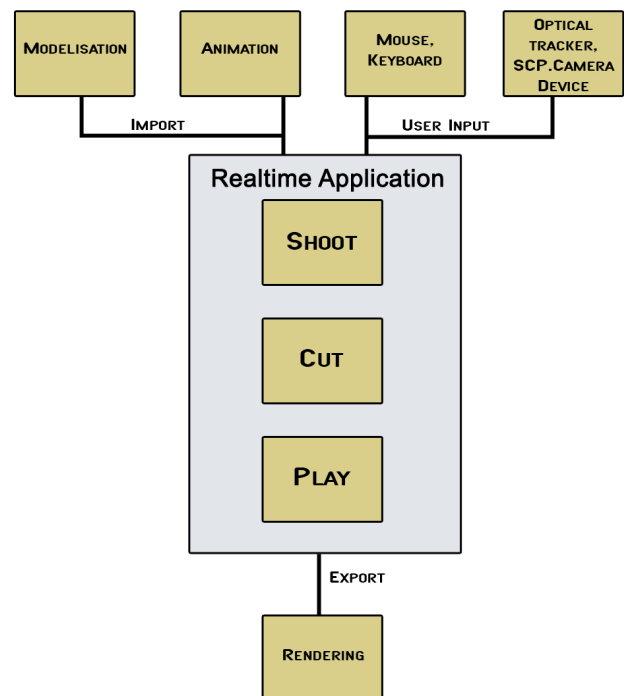


Figure 2: SCP.Camera functions outline

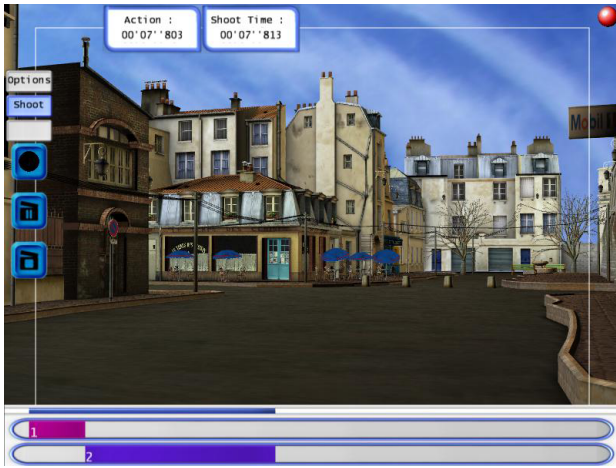
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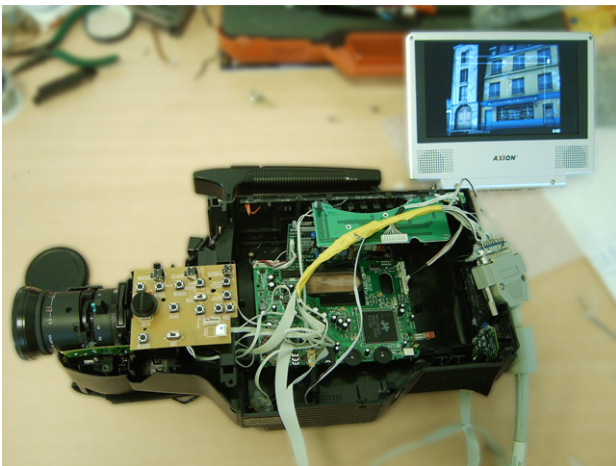
The Shoot mode (blue) concerns all topics in relation with the record step : the background action (crowd, traffic, ...), the main characters action (displacements, dialogs) and most of all the camera movements. Helped with the SCP.Camera device, a fake camera, developed to increase the immersion in the virtual world, the user can move freely in the environment.



**Figure 3:** *The SCP.Camera interface*

An optical infrared tracker system capture the position and orientation of the camera, and send those data to the application which move the virtual camera accordingly. More over, buttons placed on the device enable the user to control directly the interface, and thus the actions and parameters, like start a shot, adjust the zoom and depth of field. A LCD screen placed in front of the user's eyes gives a real-time feedback of the scene.

The SCP.Camera device, although it has the shape of a real camera, cannot capture live pictures. Its purpose is only to immerse the user in the virtual world. Its design, derived from a real empty camera, coupled with the infrared tracking system, allows one to meet again with a natural way of shooting. The device is immediately user-friendly and those who are familiar with cameras will easily find their bearings, while they can be confused with traditional computer interface (mouse, keyboard, 3D software navigation).



**Figure 4:** *The SCP.Camera device (Work in progress)*

The cut mode (Orange) uses a traditional double track montage sys-

tem, for readability, where each sequence is represented by a colored box and a unique number. The user can edit and modify his sequences : cut, duplicate, order them, or even extend or shorten them. He can use the Play mode (Green) to visualise the effects of those modifications, and see the result of his work. At any time, the user can switch from any mode to another and edit endlessly his work.

With those basic options come more to increase the interest of the SCP.Camera project. First, one can import a 3D scene exported for virtools from all usual 3D Software (\*.nmo file), save his shots and montage, and open them for editing, and also leave comments on a montage. He can also display a 4/3 and 16/9 action gate, choose to use the depth of field effect, and export a montage to a 3D software for rendering purpose. Using HLSL, he can also have real-time effects such as depth of field, motion blur or sequences transitions and video filters.

Above all, the export feature allows a larger experience. Indeed, thanks to a Maya import plugin, cameras are created and animated according to his montage. The idea is to use a low resolution of one's scene, import it in the SCP.Camera application, create camera movements, montage, and export the animation back into the 3D software. Moreover, the animation imported from SCP.Camera are synchronised with the characters animation, to get a result identical to the one seen in the montage interface. The CG artist's work is simplified again, as a batch file is created to render automatically the scene.



**Figure 5:** *Using the SCP.Camera*

### 3 Conclusion

This application goes further than a simple tool for prototyping shots or 3D storyboards, and create a real link between real-time action and 3D animation and rendering softwares.

The immersive was designed for those people who feel more comfortable with a camera than with a mouse to find a natural way of shooting and keep their professional habits.

Furthermore, one can imagine a new work concept, with a network based collaborative workflow, enhanced by real-time engines. Different users could join in a virtual space and work together : cameraman, director, light director, actors would have new tools to prepare their work.